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# USSR Report

ENERGY

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10 August 1984

USSR REPORT  
ENERGY

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## OIL AND GAS

### OIL, GAS RESEARCH DUPLICATION, LACK OF INTEGRATION CRITICIZED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Jun 84 p 2

[Article, published under the heading "How Can Adoption Be Accelerated?" by Doctor of Geological and Mineralogical Sciences Professor E. Khalimov, honored scientist RSFSR, and Candidate of Technical Sciences A. Smirnov, Moscow: "At the Ministry Threshold"]

[Text] Acceleration of the pace of scientific and technological progress has today become a determining factor in intensification of the economy. Acquiring paramount significance in this connection is the problem of improving the efficiency of operation of branch scientific research organizations, which are called upon to respond promptly to the needs of production and to exert direct influence on boosting the technological level of production.

It is no secret that practical return on branch science currently leaves much to be desired. We should like to draw attention to one of the reasons for this situation, which in our view is one of our most important problems. We are dealing with a lack of essential coordination of the activities of branch scientific organizations working in a common research area but subordinated to different ministries and agencies.

The designated lead organizations, which are responsible for development of scientific and technological progress in their subbranches, should do a reliable job of preventing the wasting of effort on trivial topics and duplication of effort on the same idea. We shall take a closer look at how they are performing their function, using as an example scientific subdivisions of the oil and gas complex.

In the Ministry of Petroleum Industry, for example, lead scientific organizations were specified in 1981. Preeminent specialized institutes, well known in the industry, became lead organizations: in oil and petroleum gas production -- the All-Union Oil and Gas Institute; in well construction -- VNIIBT [All-Union Scientific Research Institute for Drilling Techniques]; in readying oil and gas resources for exploitation -- IGI [Institute of Geology and Fossil Fuels].

Everything was done correctly, it would seem. VNIIBT, for example, has at its disposal everything it needs in order to direct work on improving equipment and technology of drilling oil and gas wells. And yet in actual fact this institute has been unable to assume in full measure the function of management of scientific and technological advance in this area.

This can be easily proven. Suffice it to note that numerous organizations of the USSR Ministry of Geology and Ministry of Gas Industry are conducting, parallel with VNIIBT, research and development in the area of oil and gas drilling. Nor do they consider it necessary to coordinate their project topics with VNIIBT, which leads to scattering of manpower and resources. At the same time the designated lead institute is primarily performing tasks assigned by its ministry -- the Ministry of Petroleum Industry -- sometimes ignoring the vital needs of the gas people and geologists. What is the reason for such discordance?

The fact is that what at one time was a single branch of the economy -- the oil and gas industry -- at a certain stage in its development was subdivided into a number of ministries and agencies. Constituting part of the country's fuel and energy complex, however, it continues to exist as a single entity -- with its specific features of production, equipment, and technology. While dividing the branch up according to the principal categories of production activity can be considered justified (caused by a sharp increase in volume of activities and increasing complexity of management), simultaneous dismemberment into different agencies of branch scientific research and design organizations has led to unjustified duplication of research on problems falling within the same category.

It is difficult to understand, for example, why geologists had to engage in laborious research in the area of theory of drilling processes and modeling of drilling technology, as is indicated by their recent publications. Or for what purpose branch institutes of the Ministry of Gas Industry must devise "their own" theory of development of oil and gas fields, different from that which the organizations of the Ministry of Petroleum Industry have been using for many years. Such things cannot be explained other than by considerations of ministerial prestige.

Serious conflicts arise on this soil. Branch institutes of the USSR Ministry of Geology have devised a system of methods of calculating crude oil reserves in so-called complex-structure reservoirs. In devising this system, they ignored the many years of experience in solving similar problems at organizations of the Ministry of Petroleum Industry. The oil people do not recognize these methods, believing that they were devised solely for the purpose of artificially overstating the quantity of prepared oil and gas reserves. In their opinion reserves calculated on this basis for a number of structures exceed actual reserves by 10-fold or more. The geologists of course argue the opposite. Both sides insist they are right, and to date there is no officially ratified method.

Ministerial considerations lead to a situation where the institutes of the Ministry of Petroleum Industry and the Ministry of Gas Industry adopt different production schemes for two adjacent oil and gas fields in Western



Siberia which are similar in geologic structure. On their recommendations one is being operated as an oilfield (gas is being left in the ground), and the other as a gas field (the crude is counted as irretrievable loss). And frequently far from the best field layout and transfer arrangements are selected.

The disconnected nature of scientific subdivisions, in view of limited resources, hinders the performance of large-scale research projects capable of exerting decisive influence on speeding up technological advance in the oil and gas complex. At the same time some useful new innovations devised by the specialists at one ministry are not utilized by others for a long period of time. A similar fate, for example, befell modern downhole mud motors. They are being successfully employed in the oil industry for high-speed deep well drilling. But the geological exploration people are still in the process of considering this equipment.

A similar situation prevails as regards data support for scientific research activities. It is true that several years ago an attempt was made to coordinate in some way the scattered activities of scientific and technical information agencies of related ministries by establishing an automated oil and gas scientific and technical information system subject area integration. It encompassed data support institutes of the Ministry of Petroleum Industry, Ministry of Gas Industry, Ministry of Geology, Ministry of Chemical and Petroleum Machine Building, and the Ministry of Construction of Petroleum and Gas Industry Enterprises.

Practical experience has shown, however, that "subject-matter" rather than organizational integration is not very effective. One can reach such a conclusion just on the basis of information publishing activity. At the present time information on subjects pertaining to drilling, oil and gas geology, and geophysics is being published on a duplicating basis by three branch institutes -- the All-Union Scientific Research Institute for OENG [expansion unknown], VNIIEgazprom [All-Union Scientific Research Institute of Economics of the Gas Industry] and the All-Union Scientific Research Institute of Economics of Mineral Raw Materials and Geological Exploration; on oil and gas machinery and equipment -- the All-Union Scientific Research Institute of OENG, VNIlgazprom, and the Central Institute of Scientific and Technical Information for Chemical and Petroleum Machine Building.

As a result the volume of informational materials being published is excessively inflated. Last year it totaled approximately 2,500 publisher's accounting sheets. A good half of this is sheer deadwood, engendered by duplication.

The examples cited above are perhaps sufficient to reach an unequivocal conclusion: the lack of unity and coordination in scientific research has become an important obstacle in the path of accelerating the pace of technological advance in associated branches. The efforts of many individuals shatter, as it were, against the ministerial threshold. It follows from this that organization of scientific research and the administration of science should be not of a ministerial but of a branch character in the broad meaning of the word. But how should this be done in practical terms?

In our opinion the following is a possible solution. Combined technological scientific-technical centers (NTTs) for the principal areas of oil and gas production should be established, based on separate, scattered ministerial scientific organizations. Each such NTTs would be fully responsible for development of its research area: oil and gas geology, oil and gas geophysics, well drilling, oil and gas field development, etc. These centers could be placed under that ministry where the given area is most developed, or under the USSR State Committee for Science and Technology, or more precisely, a newly established oil and gas department in the State Committee for Science and Technology.

Of course the regulations governing these centers should give them the requisite powers and capabilities to perform their assigned tasks. Evidently it would be appropriate to establish under the scientific and technical centers integrated scientific and technical councils, which would include representatives of all ministries and agencies involved in working on specific scientific and technical programs.

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## OIL AND GAS

### GAS INDUSTRY SAFETY MEASURES REVIEWED

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 5, May 84 pp 1-3

/Text/ Workers in the natural gas industry, like all Soviet citizens, have enthusiastically welcomed not only the decisions of the February 1984 Special Plenum of the CPSU Central Committee, but also the positions and conclusions contained in the speech to the Plenum by CPSU Central Committee General Secretary K. U. Chernenko. They have accepted the guidance of these decisions and will fulfill them as a specific program of practical activity in order to successfully fulfill the planned tasks for 1984 and for the 11th 5-Year Plan as a whole.

In the first quarter of this year, 2.9 billion cubic meters of natural gas above plan were produced. Compared with the same period last year, production increased by 11.9 billion cubic meters. The volume of production achieved was 2.5 percent over plan. Over 60 percent of the production was achieved through increases in labor productivity.

The gas industry is a large, multifaceted technological sector of heavy industry with great productive and economic potential. Of great importance in the swift growth of this sector, in the significant increase in the volume of drilling and construction-installation work and in growth of the work force are the following factors: 1) ensuring safe working conditions, 2) prevention of accidents and fires and 3) improving the working conditions while maintaining high standards of production.

The strictest control has been established at the sector's enterprises over the observance of safety rules, technological discipline and preventive maintenance schedules for equipment and utilities. As a result, the number of injuries in the natural gas industry was reduced by 6.5 percent in 1983 compared to the previous year. Injuries were reduced in 29 associations and 54 enterprises.

The following collectives were recognized as being the best in last year's All-Union Central Trade Union Council-sponsored All Union Review of Working Conditions and Labor Safety: Soyuzgazprom, Zapadtransgaz, Prikarpattransgaz, Uraltransgaz, Kirgizgazifikatsiya and Tashgaz associations, the Kasporneftegazflot Administration and others.

In 1983, the ministry, together with the Central Committee of the Gas and Oil Industry Trade Union, USSR Gosgortekhnadzor and USSR Glavgosgaznadzor, conducted extensive inspections of safety equipment at almost all of the sector's associations and enterprises. Mass inspections to certify workplaces and correct shortcomings were organized.

An overall target-oriented program was developed, approved and is being successfully implemented in the sector to improve safety conditions. In accordance with this program, large-scale measures are being implemented to re-equip the means of production and increase the level of safety: 370 sites and enterprises have been reconstructed and a large volume of work has been done to modernize and replace equipment and to mechanize and automate labor-intensive processes. Five million rubles worth of sanitary and service projects have been built.

In order to improve the level of professional preparation in labor safety procedures at all enterprises, a system of programmed instruction and hands-on testing of knowledge was implemented. In 1983 alone, over 500 textbooks for programmed instruction were sent to enterprises, 512 safety instructions were established for dillers, the trades, power-generating equipment operators and others.

Much attention has been given to the constant increase in labor safety knowledge among managers and engineering and technical personnel, as well as among safety service workers.

A correspondence school for improving qualifications has been successful. A faculty for labor-safety qualifications improvement has been established at the All-Union Polytechnical Correspondence Institute. The faculty is in its 5th year of preparing specialists, managers, engineers and technical personnel in all the sector's divisions.

The associations regularly review, at plan sessions and selector conferences, the industrial accident situation and the implementation of measures to improve worker safety. As a rule, the managers of administrations, Gosgortekhnadzor districts and kray, oblast and city trade-union committees participate in the meetings, as do technical inspectors for trade unions and workers at public health-epidemiological stations. Problems with industrial injuries and accidents are discussed at directors' councils and by the ministry's management; they also discuss improvements in working conditions and safety conditions.

A Council of Labor Safety was created to systematically study the causes of accidents. The council has successfully operated for several years. It is made up of managers from most of the ministry's administrations, representatives of the Trade Union Central Committee, USSR Gosgortekhnadzor and USSR Glavgosgaznadzor.

In recent years, the sector has given particular attention to improving labor-safety work. In 1983, 125 offices were built and put into operation. These offices are equipped with the necessary equipment to teach safety and to test safety knowledge. There are now a total of 1,192 such offices.

In 1982, the ministry ordered the manufacture of 600 copies of three films, 3,000 film strips (3 titles) and 45,000 copies of 21 safety posters and signs for distribution to the enterprises. Over 7,000 copies of instructions and norms were published and sent to the enterprises.

A number of very important normative documents were developed and implemented. Among them were Safety Rules for Operating Main Gas Pipelines and the Unified Control System for Labor Safety in the Gas Sector. The latter provides for a complete restructuring of all labor-safety activities, the participation of management and engineering and technical personnel and the responsibility of each person in creating safe working conditions.

The sector's practice is to award an enterprise the title "Enterprise of Communist Labor" only after it has received the award "Enterprise of Good Working Conditions with High Production." This latter important award has been given to 95 enterprises and organizations and to 2,643 shops and sections in the sector.

The work experience of the Zapadtransgaz Association in improving working conditions while retaining high standards of production has been reviewed and approved by the presidium of the trade-union central committee and is recommended for wide implementation. The administration and the trade-union committee of the association have determined specific responsibilities of management and engineering and technical personnel for workplace conditions and for fulfilling stipulated measures and the directions of technical inspectors and Gosgortekhnadzor units. Specific indicators have been implemented for divisions and shops. These indicators make it possible each month to evaluate the work of every collective and to implement a daily evaluation of the labor safety situation and the causes of violations.

Improving the standards of production, improving working conditions and daily concern for personnel have allowed the association's collective not only to achieve high technical-economic indicators, but also to overfulfill government plan tasks, completely eliminate serious injury and sharply reduce the number of accidents.

Excellent working conditions along with high standards of production were achieved by the collective of the Drogobych Experimental-Mechanical Special Equipment Plant. Their labor-safety work has been completely changed over from monitoring compliance with rules and instructions (which was not always effective) to controlling the labor safety conditions. The enterprise developed, along with the trade-union committee, a structured system for controlling labor safety based on safety standards.

Good working conditions with high standards of production and the implementation of a labor safety system allowed the plant's collective to overfulfill its labor productivity plan by 5.2 percent, significantly, reduce the number of injuries, clearly determine the duties of officials in creating safe working conditions, adjust planning work to remove potential causes of injuries and sharply reduce the number of work days lost due to disability. The plant's experience was approved by the Lvov Oblast Council of Trade Unions and was recommended for broad implementation.

The ministry, together with the Oil and Gas Industry Trade Union Central Committee, conducted a public inspection month to improve the technical and safe operation of sites and improve labor safety at enterprises in the gas industry. Over 80 percent of the collectives took part in the program. During the month, a large volume of equipment, fittings and piping that did not meet safety standards was replaced; dressing rooms, showers, laundry facilities for special clothing and medical facilities were equipped. The good work of 22 enterprises and organizations was noted during the inspection month.

Over 10,000 labor safety inspectors are successfully working in the sector. A competition for the title "Best Public Labor Safety Inspector in the Gas Industry" has been organized. By a decision of the colleagues of the Ministry of the Gas Industry and the Trade Union Central Committee Presidium, this honorary title was given to 93 public labor-safety inspectors. They include M. D. Virsta, machine operator at the Bitkovskaya Auxiliary Compressor Station of Prikarpattransgaz; F. Z. Abdul'manov, plumber with the Abdumenskoye LPU of Orenburgtransgaz and V. P. Zavgorodniy, senior engineer at the Uraltransgaz Association. Almost all of those who won the title were involved in training young people.

Much attention is given to preventing blowouts during the drilling and operation of wells. Attention is also given to preventing gas explosions at preparation, local transport and refining facilities for sulfurous gas at the Orenburg and Mubarek Gas-Chemical Complexes and at the Astrakhan Gas-Condensate Field.

The overall labor safety program will be implemented on the basis of several factors. The first of these is the universal implementation of six-stage inspection provided in the Unified System of Labor Safety Management in the Gas Industry. The second is to broaden the network of areas and sites for the practical training of workers in work safety rules and emergency work in case of an accident or a blowout. Third is the universal implementation of the positive experience of enterprises, shops, brigades and workers in high-production, accident-free work practices. Fourth is to raise the responsibility of managers and engineering and technical personnel for observing safety rule requirements.

The conducting of complete labor safety inspections at enterprises has fully justified itself. Taking this into account, the ministry, together with Gosgortekhnadzor, the Oil and Gas Industry Trade Union Central Committee and USSR Glavgosgaznadzor, is planning to increase the effectiveness of such inspections by including all labor-safety workers.

Labor-safety propaganda forms and methods will be developed and improved. The improved methods will be implemented for the work of militarized blowout-prevention, gas-rescue and fire-protection departments.

The implementation of labor-safety measures will aid in the elimination of production injuries and the development of healthy and safe working conditions in the gas industry.

## OIL AND GAS

### RESULTS OF 1983 SOCIALIST COMPETITION ANNOUNCED

Moscow NEFTYANIK in Russian No 4, Apr 84 p 4

[Editorial: "Red Banners Conferred"]

[Text] The results of the All-Union Socialist Competition for the Third Year of the 11th Five-Year Plan have been reviewed. On the basis of work done in 1983, 12 oil industry enterprises have achieved the highest honors.

Nine enterprises have been awarded the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the VLKSM [All-Union Lenin Young Communist League] Central Committee and have had their names entered on the All-Union Board of Honor at the USSR VDNKh [Exhibition of Achievements of the National Economy of the USSR]. It is gratifying that there are new names, along with those of well-known collectives, among the victors. The "geography" of the branch's progressive collectives has been expanded significantly.

The Order of the Red Labor Banner has been awarded to:  
the Arlanneft' [Arlan Petroleum Association] gas- and oil-extraction administration of Bashneft' [Association of the Bashkir Petroleum Industry];  
The Bogatovskneft' [Bogatovsk Petroleum Association] gas- and oil-extraction administration of Kuybyshevneft' [Association of the Kuybyshev Petroleum Industry]; the Kumdagneft' [Kumdag Petroleum Association] gas- and oil-extraction administration of Turkmenneft' [Turkmen Petroleum Association];  
the Leninogorskneft' [Leninogorsk Petroleum Association] imeni 60-letiya SSSR of Tatneft' [Tartar Petroleum Association] imeni V. D. Shashin;  
Nizhnevolzhskneft' [Lower Volga Petroleum Association]; the Rechitsaneft' [expansion unknown] gas- and oil-extraction administration of Belorusneft' [Belorussian Petroleum Association]; the Surgut Drilling Administration No 2 of Surgutneftegaz [expansion unknown]; Ukrneft' [Association of the Ukrainian Petroleum Industry]; the Uganskneftegaz [Ugansk Oil and Gas Extraction Association].

Three enterprises were awarded the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the VLKSM Central Committee:

the Bashneftegeofizika [expansion unknown] State Geophysical Trust;  
the Druzhba Order-of-the-Red-Labor-Banner Main Petroleum Pipeline Administration;

the Order-of-the-Red-Labor-Banner Gas Treatment Plant imeni Leninskiy komsomol in Minnibayev.

The level of oil and gas condensate extraction in 1983 was 596.3 million t, which was 3.7 million t more than in 1982. The plan and the socialist obligations for the extraction of gas were overfulfilled by more than 1 billion m<sup>3</sup>.

Last year, the branch's drilling enterprises and organizations drilled through 25,762,000 m of rock, which was an increase of 2,441,000 m over 1982.

The amount of work done by the drilling enterprises using the expeditionary work shift method in Western Siberia continued to increase. In 1983 they drilled 57,472,000 m of boreholes, which was 12,392,000 m more than in 1982.

The workers, engineering and technical personnel and employees of the Yuganskneftegaz association of Glavtyumenneftegaz [Main Administration for Petroleum and Gas for the Tyumen' Region] were in the vanguard of the 1983 competition. They pledged to produce 600,000 t of oil above the plan, but managed to produce 763,000 t instead.

There were 24 associations that managed to deal successfully with increased socialist obligations for the extraction of gas and oil in 1983. Among them were the collectives of Bashneft', Mangyshlakneft' [Mangyshlak Petroleum Association], Kuybyshevneft', Turkmenneft', Ukrneft', Grozneft' [Groznyy Petroleum Association, Nizhnevolzhskneft', Udmurtneft' [Udmurtiya Petroleum Association], Permneft' [Perm' Petroleum Association], Tatneft' and others.

It is hoped that the progressive collectives will also set a labor example this year and inspire all the branch's workers to operate in a highly productive shock labor mode.

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## OIL AND GAS

### ACHIEVEMENTS IN GAS AND OIL EXTRACTION IN 1983 NOTED

Moscow NEFTYANIK in Russian No 4, Apr 84 pp 5-8

[Article by L. Zatsepina and N. Aleksatkina, Ministry of the Petroleum Industry: "Right-Wingers"]

[Text] Many of our branch's gas and oil extraction sections and key professional crews completed the third year of the 11th Five-Year Plan successfully. The oil workers' goals were to achieve a further improvement in the quality and efficiency of their work, save raw materials, materials and fuel and energy resources in all possible ways, and strengthen their labor and production discipline.

More than 5,200 gas and oil extraction sections and key professional crews reported that they had fulfilled their planned quotas for 1983 ahead of schedule and about 4,800 crews said they had fulfilled the plan for the first 3 years of the five-year plan ahead of time. For the branch as a whole, 395 (88.8 percent) of 445 gas and oil extractions sections fulfilled the plan and 348 (78.2 percent) met their socialist obligations; for 1,287 gas and oil extraction crews, the corresponding figures were 1,138 (88.4 percent) and 1,024 (79.6 percent), respectively; for 1,271 underground well repair crews, the respective figures were 1,047 (84.4 percent) and 1,014 (81.7 percent); for 1,117 capital repair crews, they were 851 (76.2 percent) and 803 (71.9 percent).

The diggers into the depths and their associates continued their competition under the slogan "Oil Wells--On Line." They fought for a further improvement in the efficiency of drilling work and technical and economic indicators, as well as the achievement of the established maximum limits for each specific field.

In 1983 the collective of the crew led by Foreman V.L. Sidoreyko (the Surgutneftegaz [Surgut Oil and Gas Extraction Association] again set a new branch record for cutting through rock by drilling a total of 117,500 m. Other well-drilling collectives that passed the 100,000-m mark were the crews led by Foreman A. A. Shukuyurov, Yu. N. Gertner, A. V. Puminov (the Surgutneftegaz association) and O.S. Sorokin (Nizhnevartovskneftegaz [Nizhnevartovsk Oil and Gas Extraction Association]). The drilling crew led by Hero of Socialist Labor and USSR State Prize laureate A.D. Shakshin (Nizhnevartovskneftegaz) drilled more than 95,000 m of boreholes; A.D. Spitsyn's crew (Surgutneftegaz) passed the 90,000-m mark; S.G. Pomogaybin and his crew (the Uganskneftegaz association), along with the crews led by V.M. Anaykin (Surgutneftegaz), V.M. Poletayev (Nizhnevartovskneftegaz) and Leninist Komsomol Prize laureate T.G. Fattakhov (Tomskeft' [Toms Petroleum Association]) drilled more than 80,000 m.

The collectives of the drilling crews working by the expeditionary work shift method in Western Siberia labored successfully during the third year of the 11th Five-Year Plan. The greatest amount of drilling in Glavtyumenneftegaz's [Main Administration for Petroleum and Gas for the Tyumen' Region] fields was done by the drilling crews headed by V.I. Tselibin and A.A. Martin (95,400 m) and Yu.I. Abakumov and M.V. Bondarenko (95,200 m) from Saratovneftegaz [Saratov Petroleum and Gas Association], T.M. Il'yasov and M.K. Timerkaliyev (66,300 m) from Tatneft' [Tatar Petroleum Association], F.G. Timergaziyev and V.F. Korniyakov (64,800 m) from Bashneft' [Association of the Bashkir Petroleum Industry], N.D. Malyarchuk and V.V. Furdyyak (61,500 m) from Ukrneft' [Association of the Ukrainian Petroleum Industry], L.A. Nikishin and P.A. Lebedev (67,300 m) from Kuybyshevneft' [Association of the Kuybyshev Petroleum Industry] and N.Ye. Matsygud and A.V. Gamov (50,000 m) from Belorusneft' [Belorussian Petroleum Association].

Of the crews working by the expeditionary work shift method, 28 drilled more than 50,000 m and 40 did more than 40,000 m.

By assisting each other and guaranteeing their associates optimum dates for and quality of their work, all the crews of master fitters in Yuganskneftegaz, Udmurtneft' [Udmurtiya Petroleum Association], Grozneft' [Groznyy Petroleum Association], Stavropol'neftegaz [Stavropol' Petroleum and Gas Association], Gruzneft' [Georgian Oil Field Administration], Belorusneft', Uzbekneft' [Uzbek Petroleum Association] and Tadzhikneft' [Tadzhik Petroleum Association] and all the well-sampling (testing) crews in Stavropol'neftegaz, Ukrneft', Aktyubinskneft' [Aktyubinsk Petroleum Association], Tadzhikneft' and Soyuztermneft' [Soyuzterm Petroleum Association] coped with their planned assignments and socialist obligations.

The branch's construction organizations erected 1,478,000 sq. m. of living quarters, and schools with a capacity of 11,416 places. There were no lagging collectives in Krasnodarneftegaz [Krasnodar Oil and Gas Extraction Association], Gruzneft', Aktyubinskneft', or Soyuztermneft'; in Bashneft', Saratovneftegaz, Grozneft' and Stavropol'neftegaz more than 90-95 percent of the construction crews met their planned quotas and socialist obligations. More than 370 crews were converted to the contractual method of construction.

Much attention was given to work on the dissemination and introduction of the progressive experience of the branch's best collectives. In Kuybyshev there was a conference for the exchange of experiences among the organizations for the repair of basic and auxiliary equipment by the aggregate-unit method under the conditions of a functional central system for mechanical maintenance, whereas in Kalush there was a school for the introduction of crew forms of organization and wages at the enterprises of the Soyuzneftemashremont [All-Union Association for Oil Machinery and Instruments Repair] VPO [All-Union Production Association]. In Nefteyugansk there was a school for the study and dissemination of the work experience of Yuganskneftegaz in increasing the operating period between repairs of mechanized wells. Extensive dissemination was given to

the work experience of the PKSR [expansion unknown] crews from the Arlanneft' [Arlan Petroleum Association] NGDU [Oil and Gas Extraction Administration] of Bashneft' in increasing the operating period between repair of wells. Last year, 988 underground and capital well repair crews were armed with this experience, and all the crews will be working with the benefit of the experience of the people from Arlan.

In mentioning the successes achieved by many key professional crews, it must be said that not all the associations managed to mobilize their collectives to the unconditional fulfillment and overfulfillment of their planned quotas for 1983.

After examining the results of the All-Union Socialist Competition of Collectives of Gas and Oil Extraction Sections and Key Professional Crews for 1983, the board of Minnefteprom [Ministry of the Petroleum Industry] and the Presidium of the Central Committee of the Trade Union for Oil and Gas Industry workers named 335 collectives as victors. Let us now meet some of them.

The collective of the Gas and Oil Extraction Section No 1 of the Mamontovneft' [Mamontov Petroleum Association] NGDU of Yuganskneftegaz, led by M.M. Farrakhov, extracted 172,500 tons of oil more than the quota set for it for 1983. Specific labor costs for the maintenance of a single well were reduced by 0.033 [sic] in 1983 in comparison with the previous year, the operating period between repairs (MRP) for wells equipped with ETsN's [electric centrifugal pump] was 395 days as opposed to the planned figure of 300, and the MRP for those equipped with ShGN's was 331 days as opposed to the planned figure of 300. The section's collective has a firm friendship with new technology. The introduction of a unit for servicing measuring devices and DNS's [expansion unknown] (AZU's [expansion unknown]) made it possible to reduce labor costs and produced an annual economic effect of 79,500 rubles; the use of 5 sucker-rod pumps with integral cylinders made it possible to increase the MRP by 31 days.

For the third year in a row, the collective of the Gas and Oil Extraction Section No 4 of the Al'met'yevneft' [Al'met'yev Petroleum Association] NDCU (Tatneft'), led by O.V. Puzanov, won the title of "Minnefteprom's Best Section."

In June 1983, these producers reported that their socialist obligations had been fulfilled ahead of schedule. Our country received 8,726 tons of above-plan oil from them. The fulfillment of an agreement made with its associated collectives who were participating in insuring the introduction of new wells into operation made it possible to reduce the introduction of wells from drilling and their conversion to the mechanized extraction method from 30 days in 1980 to 14 days in 1983. By the day of the elections to the USSR Supreme Soviet, the section's collective had decided to produce 1,000 tons of above-plan oil and complete its assignment for the five-year plan as a whole ahead of schedule.

V.F. Novichkov's Gas and Oil Extraction Crew from the Nizhnevartovskneft' [Nizhnevartovsk Petroleum Association] NGDU (Nizhnevartovskneftegaz) fulfilled its 1983 plan ahead of schedule, on 29 December. Its above-plan oil production was 25,900 tons, its exploitation factor was raised to 0.956 (as opposed to the planned figure of 0.952), and 4 innovative suggestions with an economic effect of 1,500 rubles were introduced.

The Gas and Oil Extraction Crew from Uzen'neft' [Uzen' Petroleum Association] (Mangyshlakneft' [Mangyshlak Petroleum Association]) that is led by K.V. Lyamin worked under difficult climatic conditions, but for the second year in a row won the title "Minneftoprom's [Ministry of the Petroleum Industry] Best Crew." Last year it extracted 402,600 tons of oil and gas condensate, which was 10,200 tons more than called for in its plan; above-plan gas production was 300,000 m<sup>3</sup>.

Activities in the zone near the face (by the gas-condensate and the thermal-gas-chemical methods) and the use of glazed NKT's [expansion unknown] enabled the crew to increase the MRP of wells equipped with ShGN's by 19 days, to a total of 268 days, whereas that of gas-lift wells was increased by 9 days, to 626; in connection with this, the exploitation factor for the group of wells in operation was 0.946, as opposed to a planned figure of 0.941.

High production indicators were achieved by N.P. Petrov's crew in the Zhirnovsk NGDU (Nizhnevolzhskneft' [Lower Volga Petroleum Association]). They overfulfilled their assignment for the year by 3.8 percent and went over the plan by 5,500 tons of oil and 400,000 m<sup>3</sup> of gas.

The crew is an active introducer of new equipment and technology: sucker-rod pumps with an integral cylinder, treatment of the preface zone of wells with organic solvents. This enables them to increase the MRP of wells with ShGN's by 12 days, whereas the figure for wells with ETsN's was raised by 88 days. All the crew members are active innovators. During the year they came up with and introduced five suggestions that had a good economic effect.

The communist labor collective led by Capital Well Repair Foreman P.L. Lotov of the Zavolzhsk NGDU (Saratovneftegaz [Saratov Petroleum and Gas Association]) overfulfilled its plan for the year by 9.4 percent and carried out all its repairs faster than scheduled. Oil extraction from the above-plan wells that were repaired was 480 tons, and the savings from the reduction in repair costs was 5,100 rubles.

The collective of the Capital Well Repair Crew from the Strezhevoyneft' [Strezhevoy Petroleum Association] NGDU (Tomskneft) that is led by Foreman S.A. Grebenyuk reported that it had fulfilled its plan for the first 3 years of the five-year plan ahead of schedule, on 17 May 1983. The 1983 plan was overfulfilled by 25 percent, the average duration of a single repair was reduced by 21.2 h, and productive time amounted to 99 percent. Oil extraction from the above-plan wells that were repaired was 3,459 tons. The collective has been awarded the title "Collective With High-Grade Production."

USSR State Prize laureate and shock worker of the Ninth, 10th and 11th Five-Year Plans, Underground Well Repair Foreman V.I. Lorgin, from the Uray Administration for Increasing the Oil Yield of Beds and Capital Well Repair (Krasnoelninskneftegaz [Krasnoleninsk Oil and Gas Extraction Association]) is well known in this branch. For 10 years in a row, the collective he heads has occupied prize positions in the All-Union Socialist Competition. It fulfilled the plan for the first 3 years of this five-year plan by the 66th anniversary of the Great October Revolution. It also repaired 12 wells more than its plan called for: the MRP of wells equipped with ETsN's was 272 days, as opposed to the planned figure of 225, whereas for those equipped with ShGN's it was 306 days as opposed to the planned 230. Repair costs were reduced significantly.

Having engaged in competition under the slogan "The Plan for 3 Years of the Five-Year Plan--by the 80th Anniversary of the Second RSDRP [Russian Social Democratic Workers' Party] Congress," the collective of the Underground Well Repair Crew from the Pervomayneft' [Pervomay Petroleum Association] NGDU [Kuybysneft'] that is led by P.M. Gonnov fulfilled its 3-year assignment ahead of schedule, on 27 July 1983. It repaired 27 wells more than were specified in its 1983 plan. The number of wells serviced per watch was 38 (as against the norm of 21); the MRP was increased to 500.4 days, although the planned figure was only 390.2

B.G. Imangulov's Underground Well Repair Crew, from the Sarapul NGDU (Udmurtneft') fulfilled its plan for the first 3 years of the five-year plan by the 66th anniversary of the October Revolution.

Since 1 April 1983 the crew's collective has been working on the basis of the experience of the progressive enterprises in Bashneft', utilizing the orderless system for organizing and paying for labor. This made it possible to reduce the number of idle wells from the stock of wells assigned for that purpose (45 wells per watch) to 2.6, as against the norm of 2.7, and the crew's productive time was 96.7 percent.

Working under the slogan "For Well Repairs--High Quality," the crew assumed its basic goal to be to provide high-quality repairs, not tolerate idle time on the watches, and achieve a maximum reduction in labor and materials costs for repairs. For the year it saved 5,200 rubles, which made it possible to reduce the cost per repair by 93 rubles in comparison with 1982, thereby lowering it to 1,201 rubles by the end of 1983. The MRP of wells equipped with ShGN's was increased to 315 days by the end of the year, whereas for those with ETsN's it was increased to 356 days. The exploitation factor was 0.947. Because of optimization of the well stock's operating modes and the systematic implementation of geological and technical measures, there was an addition 12,800 t of oil extracted from the wells serviced by this crew's repairmen.

Foreman D. Ayazbayev's Underground Well Repair Crew, from the Kul'saryneft' [Kul'sary Petroleum Association] NGDU (Embaneft' [Emba Petroleum Association]) worked well last year. The average duration of a single repair was reduced by 1.67 h over the obligations assumed for the year and productive time was increased by 2.76 percent. These repairmen give a great deal of attention to saving materials and fuel, as a result of which the consumption of pump rods, steel-wire rope and oil used for scrubbing was reduced.

Since July 1982 the crew has been working by the method used by the Arlan' oil workers. This made it possible to achieve a significant improvement in the quality of their repairs; their well MRP was 120 days (and they had vowed to increase it to 110).

A notable contribution to the success of Surgut UBR [Drilling Operations Administration] No 2 (Surgutneftegaz) was made by the drilling crew led by Foreman A.P. Puminov. Participating actively in the All-Union Socialist Competition for the Early Fulfillment of Assignments for the 11th Five-Year Plan and working under the slogan "High Labor Productivity at Each Working Place, this

crew's collective fulfilled its plan for 1983 ahead of schedule, on 23 July, and on 15 August it reported that it had completed the 4-year plan, in the amount of 245,000 m. The 100,000-m drilling border was passed on 27 November.

In 1983 the crew drilled 105,977 m of oil wells, as against a planned assignment of 62,000 m and socialist obligations of 100,000 m. In comparison with 1982, the amount of drilling increased by 15,912 m, or 17.7 percent. The crew finished 46 wells, all of which were graded good or excellent; productive time was 96.6 percent.

The successes that have been achieved were the result of high professional skills, the extensive use of progressive production experience, the introduction of the progressive achievements of science and drilling technology and equipment, and the ideological maturity and civic activities of the crew members.

This crew has a long and extensive history of using zaklonnyye [probably tempered] packers, operating column suspension elements in the jig, aeration and hydroactivation of the tamponage solutions and so on. This results in a significant savings of working time and improves the quality of the work. The economic effect from the introduction of these measures was 223,700 rubles.

The tutor movement is of considerable importance for the efficiency of the crew's work. The best tutors, A.N. Bozhko and A.V. Popov, monitor their assistants constantly and help them in the fulfillment of their production assignments. The combination of professions is used extensively. Electricians and machinists replace drillers' assistants and, on the contrary, drillers and their assistants replace welders and, when necessary, drive tractors.

A.P. Puminov's crew works according to the crew contract method. It has concluded an agreement about socialist competition with the collectives of allied enterprises (tower assembly crews, casing crews, geophysical parties), which enables it to work without idle time until the final result is achieved. In 1983, during the well construction cycle drilling lasted for 14.4 days during the tower erection stage as against a planned figure of 17.0 days.

For many years the collective from Nizhnevartovsk UBR No 2 (Nizhnevartovskneftegaz) that is led by Hero of Socialist Labor and USSR State Prize laureate A.D. Shakshin has been in the vanguard of the socialist competition among drilling crews. By drilling 64,000 m of wells by 31 August, the crew became the first in that administration to fulfill its plan for 1983, and on 1 December it completed the plan for the first 4 years of the five-year plan (261,000 m). Its socialist obligations were met on 21 December: 92,000 m of wells had been drilled. This result was achieved for the first time in the crew's history. It is also a record for the administration's drilling collectives. In all in 1983, the crew drilled 95,050 m, which was an increase of 4,905 m over 1982, for an output per worker of 204 m.

The best indicators were achieved by the watch led by Driller G.I. Shtefan, which drilled more than 27,000 m during the year. Other people who worked well were drillers L.G. Garifullin, N.P. Savinov and I.A. Chapcha, assistant

drillers A.P. Grevtsov, V.V. Doshchechnikov, P.Yu. Arayev and R.M. Zakuanov, Electrician V.Ye. Novichkov and Machinist B.I. Tret'yakov, along with many others.

A.D. Shakshin's crew participates actively in the "No One Lags Behind" movement. Its former assistant collectives, led by V.P. Poletayev and R.F. Shaykhiyev, have been working above the average level for a long time now. In 1983 the Shakshinites were the patrons of the lagging crew led by A.A. Kupikov, which achieved better indicators than in 1982.

The tutelage of young workers is well organized in this crew. This insures clearcut, well-organized work and full mutual understanding among the workers in the course of any production process.

In 1984, this leading collective has vowed to drill 100,000 m and to fulfill 6 annual plans during the five-year plan.

The collective of S.G. Pomogaybin's crew, from Nefteyugansk UBR No 2 (Yuganskneftegaz) fulfilled its state plan for 1983 (55,000 m) ahead of schedule, on 18 August, and on 6 November it met its socialist obligations (75,000 m). The crew's 4-year drilling plan was fulfilled on 9 October.

S.G. Pomogaybin's crew was a repeated victor in the socialist competition among the UBR's and association's drilling collectives, in the "Work Without Accident or Defect" competitive reviews, and in economy and thriftiness. Since 1981 it has been working by the crew autonomous financing method.

A school for communist labor named "Thriftiness--A Communist Feature" is in operation at the crew's base. The lessons learned in it helped the crew lower the cost of its drilling work by 580,700 rubles and save fuel, energy and material resources in the amount of 144,000 rubles.

Most of those who are newly assigned to work in the administration are trained in this crew, in the process of which they become acquainted with work methods and the correct utilization of tools and machinery. In 1983, 52 people underwent this training.

The best drilling figures in Tomsk Oblast were achieved by the drilling crew from the Strezhevoy UBR led by Leninist Komsomol Prize laureate T.G. Fattakhov. In 1983 it drilled 83,000 m of boreholes and gave the production workers 35 wells instead of the planned 27. Having entered the competition with its associated collectives under the motto "Oil Wells--On Line," the crew managed to shorten the well construction cycle by 23 percent more than the planned figure and increase its productive time to 94.0 percent.

A school for progressive experience named "Fast Drilling of Wells" is in operation at the crew's base. All of the Tomskneft' association's drilling collectives study there.

A significant contribution to the creation of the fuel and energy base in Western Siberia is being made by the drilling crews working by the expeditionary

watch method, among which a noteworthy one is the Communist Labor Crew led by foremen V.I. Tselibin and A.A. Martin of the Yershov UBR (Saratovneftegaz). This crew's account shows more than 95,000 m of drilling and 40 operating wells that were finished by drilling. This leading collective managed to shorten the well construction cycle by more than 50 percent of the planned figure. The savings from the reduction of drilling costs was 620,000 rubles.

Good production indicators were achieved by the drilling crew from the Kyursanginsk UBR (Azneft' [State Association of the Azerbaijan Petroleum Industry]) that is led by S.G. Mamedov. Working under the slogan "Five Years in Four," it completed its 1983 plan ahead of schedule, on 4 October. Its members drilled 5,058 m of operational wells (126.5 percent of the plan) and 3,814 m of exploratory boreholes (142.3 percent of the plan), and turned two wells over for operations. This crew saved 596.5 [sic] rubles for the year, primarily because of a reduction in material consumption.

A.A. Agiyevich's Communist Labor Crew, from the Rechitsa UBR (Belorusneft'), finished its assignment for the five-year plan ahead of schedule, on 30 November. The plan for 1983 was fulfilled on 31 July, and 7,811 m of drilling was accomplished, as opposed to the plan's figure of 5,000 m. Because of a reduction in the cost of drilling work and material consumption, 79,200 rubles were saved.

The crew devoted a great deal of attention to the introduction of new equipment and technology: new series of GNU, GAU and DLS 214.3 bits, multisectional face motors of the 5A7Sh type, high-strength drilling and casing pipe, automation facilities and so on. Working under the motto "No One Lags Behind," the crew offers tutelary assistance to other collectives and is doing a great deal of tutoring work.

The crew led by Hero of Socialist Labor and USSR State Prize laureate K.G. Ikhin, from the Neftekamsk Drilling Operations Administration (Bashneft'), has been a recognized leader among tower assembly crews in this branch for many years. It also achieved high technical and economic indicators in the construction of derricks in 1983: 82 derricks were erected, as opposed to the planned figure of 80; 95 percent of the derricks were erected ahead of schedule, and the duration of derrick construction was shortened by 1.75 days against the norm. The savings from the reduction in the cost of tower assembly work was 64,700 rubles.

K.G. Ikhin's crew was one of the first in the republic to introduce the integrated element system or organization of labor. In this system, the crews is divided into elements and is led by experienced tower assemblers. For several years, now, the crew has worked by the crew contract method, using KTU's [expansion unknown], which enabled it to save more than 60,000 rubles in 1983 alone.

The crew from the Tower Assembly Office of Udmurtneft' that is led by V.V. Terekhov was named a victor in the socialist competition. It set a record for Udmurtia by erecting 102 derricks, as opposed to the planned figure of 92. All the derricks were erected ahead of schedule and were turned over with



evaluations of "good" and "excellent." The average construction time per derrick was almost 40 percent below the planned figure.

The branch is faced with urgent goals for 1984: it is necessary not only to fulfill the state plan, but also to overfulfill it and meet the deficiencies that were not met in past years. Here the decisive role will belong to the leading collectives, which--thanks to their selfless labor, creative searches, intelligent use of materiel and technology, and bringing internal reserves into action--are achieving an increase in labor productivity and providing an example of inexhaustible capabilities in the achievement of high labor boundaries.

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## OIL AND GAS

### 1983 ACHIEVEMENTS OF YOUNG KOMSOMOL OIL COLLECTIVES DESCRIBED

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[Article by R. Gorshkova and A. Nikol'skiy, Minnefteprom: "The Best Young Komsomol Collectives"]

[Text] By bringing to life the decisions of the 19th Leninist Komsomol Congress, the Young Komsomol Collectives of our branch are making a noteworthy contribution to the business of strengthening this country's fuel and energy base. They are participating actively in the socialist competition under the motto "To the 11th Five-Year Plan: Shock Labor, Knowledge, Initiative and Creativity From Young Workers."

The Young Komsomol Collectives of crews of leading professions from Nizhnevolzhskneft' [Lower Volga Petroleum Association], Saratovneftegaz [Saratov Petroleum and Gas Association], Udmurtneft' [Udmurtia Petroleum Association], Grozneft' [Groznyy Petroleum Association], Krasnodarneftegaz [Krasnodar Petroleum and Gas Association], Azneft' [Azerbaijan Petroleum Association], Ukrneft' [Ukrainian Petroleum Association] and Uzbekneft' [Uzbek Petroleum Association] coped successfully with the plan and their socialist obligations for 1983.

A recognized leader in the socialist competition among Young Komsomol Collectives is the Young Komsomol Drilling Crew imeni 19th VLKSM [All-Union Lenin Young Communist League] Congress, led by foreman A.A. Shukyurov, from the Surgut UBR [Drilling Operations Administration] No 2 of Surgutneftegaz [Surgut Oil and Gas Extraction Association]. For the third year in a row, this crew (which was created in December 1980), won the title of Minnefteprom's [Ministry of the Petroleum Industry] "Best Young Komsomol Crew" and was presented with the "Heroes of the Five-Year Plans: To the Best Young Komsomol Collective" Challenge Red Banner of the VLKSM TsK [Central Committee], the Ministry of the Petroleum Industry and the Presidium of the TsK of the Trade Union of Petroleum and Gas Industry Workers.

"The plan for the first 4 years of the 11th Five-Year Plan--by the anniversary of the day of the opening of the 19th VLKSM Congress," was the vow made by the members of A.A. Shukyurov's collective, which kept it successfully: that point was reached on 15 May 1983, with 233,000 m of boreholes having been drilled. The crew's collective reported to the VLKSM TsK about the fulfillment of the five-year plan ahead of schedule, on 7 December 1983, after having drilled 299,000 m of boreholes.

Continuing to work under the motto "High Labor Productivity at Each Working Place," the Young Komsomol Collective of A.A. Shukyurov's drilling crew drilled through 108,250 m of rock in 1983, which was more than their socialist obligation of 105,000.

The amount of cutting done by this crew was 6,126 m more than the average per crew in the administration. They finished and turned over for operation 48 wells, all with good and excellent ratings. The schedule speed was 9,496 m per machine per month, productive time was 96.2 percent, and 223,600 rubles of state funds were saved.

The successful work of A.A. Shukyurov's crew was facilitated by the proper observation of drilling technology, the introduction of progressive innovations, and the use of progressive production experience. The economic effect from the introduction of three innovative suggestions was 5,600 rubles.

A drilling crew's work depends largely on the work of its associates. A.A. Shukyurov's Young Komsomol Collective works in close contact with the collectives of the derrick assembly crews, well casing crews and geophysical parties. This makes it possible to work without idle time.

The Young Komsomol Drilling Crew led by Foreman N.V. Kol'gin, from the Al'met'yevsk UBR of Tatneft' [Tatar Petroleum Association] imeni V.D. Shashin, achieved high indicators for drilling oil wells in 1983. The plan for the first 3 years of the 11th Five-Year Plan was fulfilled on 21 October 1983. Since the beginning of the five-year plan, 57 wells have been completed and 83,214 m of rock drilled through. The plan for 1983 was met on 2 December. That year the crew drilled 27,631 m, which was 1,081 m more than its planned assignment. The schedule speed reached 2,696 m per machine per month, as opposed to 2,452 m in the plan, and 10 wells were completed by the crew's efforts.

N.V. Kol'gin's crew was able to achieve high production indicators thanks to constant improvement of the well-drilling technology, the introduction of new technology, a clearcut organization of labor, and high production discipline.

Because of the introduction of new equipment and progressive technology and a thrifty attitude toward material values, the crew saved 72,400 rubles of its estimated costs for 1983.

Entering the socialist competition for 1984, Foreman N.V. Kol'gin's Young Komsomol Crew vowed to complete the plan for the 4th year of the 11th Five-Year Plan ahead of schedule, by 20 December.

A repeated victor in the socialist competition among Young Komsomol Crews of Leading Professions is the drilling crew led by Foreman V.A. Golodyayevskiy, from the Otradnyy UBR of Kuybyshevneft' [Kuybyshev Petroleum Association], and it also worked successfully in 1983.

On 3 July 1983, the crew reported that it had fulfilled the plan for the first 3 years of the 11th Five-Year Plan, and on 29 September that it had fulfilled the plan for the first 4 years.

V.A. Golodyayevskiy's crew fulfilled the plan for 1983 on 17 September. It drilled through 17,518 m of rock, as opposed to the planned figure of 11,702 m and its socialist obligation of 13,808 m, and finished drilling 6 wells instead of the planned 4. The time required to complete a single operating well was reduced by 30.2 days, to 63.7 days. The schedule speed in the drilling was actually 1,511 m per machine per month, as opposed to the planned figure of 1,010 m, and productive time was 98.3 percent. The savings from the reduction in the cost of drilling work was 347,300 rubles.

Foreman V.A. Golodyayevskiy's Young Komsomol Drilling Crew achieved good indicators during the drilling of wells by the multiple drilling method in the Kudinovskaya area, using a 3000 EUK drilling rig, and for three wells it achieved record drilling rates. This crew is notable for its high labor discipline and activity and good organization of production processes.

Having entered the All-Union Socialist Competition in Honor of the Second RSDRP [Russian Social Democratic Workers' Party] Congress and the 25-Year Movement for a Communist Attitude Toward Labor, the Young Komsomol Derrick Assembly Crew led by Crew Chief A.S. Kurochkin, from the Derrick Assembly Office of the Aznakayevo UBR of Tatneft' imeni V.D. Shashin, achieved successful fulfillment of its planned assignments and socialist obligations for 1983. It built 84 drilling rigs, of which 6 were above plan, productivity per worker was 20.1 percent above plan, the average amount of time required to construct a drilling rig was reduced by 0.87 days and was 3.09 days, and drilling rig production cost was 2.1 percent below the planned figure.

The derrick assemblers' creative activity was at a high level.

In 1983 they developed and introduced three innovative suggestions that had an economic effect of 2,020 rubles.

In 1983, Foreman V.A. Tikhonov's Young Komsomol Gas and Oil Extraction Crew from the Al'met'evneft' [Al'met'yev Petroleum Association] NGDU [Petroleum and Gas Production Administration] of Tatneft' imeni V.D. Shashin set out with initiative to work under the motto "From Each Developed Object--Maximum Oil Yield," which was supported by all the association's crews.

In the 3rd year of the 11th Five-Year Plan, this crew extracted 395,510 t of oil, which was 1,802 t above the plan, and raised its exploitation factor to 0.977 as against the planned figure of 0.962. The period between repairs for the mechanized group of wells was 455.2 days as opposed to the 408 days specified in the plan. The members of V.A. Tikhonov's crew submitted 12 innovative suggestions in 1983, with a provisional annual effect of 7,250 rubles.

Supporting the "Oil Wells--On Line" initiative of Al'met'yevsk UBR Drilling Foreman D.M. Nurutdinov, V.A. Tikhonov's Young Komsomol Crew concluded labor agreements with associated NGDU shops and drillers. As a result of this, since the beginning of the five-year plan the period for the introduction of wells into operation has been reduced from 19 to 14.2 days.

In continuing their battle for a further improvement in production efficiency and work quality, the collective of Foreman V.A. Tikhonov's crew vowed to

extract 500 t of oil above its annual socialist obligations by the 65th anniversary of the VLKSM and to fulfill its obligation with honor.

Foreman R.M. Galejev's Young Komsomol Gas and Oil Extraction Crew, from the Chekmagushneft' [Chekmagush Petroleum Association] NGDU of Bashneft' [Bashkir Petroleum Association], is working under the motto "Maximum Oil From Each Well" during the 11th Five-Year Plan.

The collective fulfilled the plan for the first 3 years of the five-year plan on 19 December 1983. During this time, 15,931 t of above-plan oil was extracted, the operating period between repairs for the wells was raised to 387 days, and the wells' exploitation factor was 0.963. The crew also produced and introduced 32 innovative suggestions with an economic effect of 40,000 rubles.

In 1983, 5,891 t of above-plan oil was extracted. The implementation of geological and technical measures that produced more than 26,000 t of additional oil contributed to the successful fulfillment of the crew's assignments.

Foreman V.A. Chilikin's Young Komsomol Capital Well Repair Crew, from the Kinel'neft' [Kinel' Petroleum Association] NGDU of Kuybyshevneft', working under the motto "All Wells Into the Group of Active Ones" in 1983, made 10 repairs, all of good quality and ahead of schedule, which resulted in 265 t of oil extracted from above-plan wells that were repaired. The average duration of a single repair was reduced by 119 h, and was 570 h. Productive time was raised to 98.6 percent as against a socialist obligation of 95 percent. The average cost per repair was reduced by 789 rubles. The savings from the reduction in repair costs was 3,300 rubles.

In the 3d year of the 11th Five-Year Plan, high technical and economic indicators were achieved by the collective of A.S. Farkhutdinov's Young Komsomol Crew for Underground Repair, from the Suleyevneft' [Suleyev Petroleum Association] NGDU of Tatneft' imeni V.D. Shashin. During the making of 167 repairs, productive time was 98 percent as opposed to the planned figure of 96 percent. The monthly average number of wells awaiting repair is 0.5, out of an active average group of 125 wells. The duration of a single repair is 43.1 h, which is under the 45.3 h stipulated in the plan. The savings from the reduction in repair costs was 8,800 rubles.

All the Young Komsomol collectives listed above are acknowledged as victors in the All-Union Socialist Competition for 1983 and have been awarded the "Heroes of the Five-Year Plans: To the Best Young Komsomol Collective" Challenge Red Banner of the VLKSM TsK, the Ministry of the Petroleum Industry and the Presidium of the TsK of the Trade Union of Petroleum and Gas Industry Workers.

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## OIL AND GAS

### EXPLOITATION OF YAKUTSK OIL, GAS RESOURCES URGED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Jun 84 p 2

[Article by M. Gubkin, secretary, Yakutsk oblast party committee: "Oil and Gas of Yakutia"]

[Text] The Yakutsk CPSU Oblast Committee is readying in its buro a report of the Lenaneftegazgeologiya Geological Production Association on organization of socialist competition for above-target boosting labor productivity and decreasing production cost. The choice is clear from the very formulation of the question: to see how the campaign to meet the supplementary party target is furthering efforts to attain the workforce's main objective -- to speed up preparation of crude oil reserves in this republic for exploitation.

The forthcoming discussion can be viewed as a continuation of a conversation held last year at the oblast committee secretariat. The discussion topic at that time was the matter of increasing labor productivity of drilling brigades in the Lenaneftegazgeologiya Association. Incidentally, we could list a number of party documents here. We have been returning continuously to this topic in one way or another ever since at the beginning of the five-year plan the party oblast committee buro ratified a comprehensive program of development of geological exploration activities for oil and gas in Yakutia for 1981-1985, for a local fuel-energy base signifies a genuine revolution for the republic's economy! But the party oblast committee also views this work as a part of an overall party task: to establish in the eastern part of this country a large new oil and gas industry raw-material base.

Ratifying the association's comprehensive geological exploration program for the five-year plan, the party oblast committee appraised it at the time as a minimum program. Therefore all subsequent activity by the republic party organization in this area pursued a single aim in the final analysis -- to make forecasts on Yakutia's oil and gas prospects reality at the earliest possible date.

Already today this reality looks rather convincing. Fifteen hydrocarbon deposits have been discovered in Western Yakutia alone. The first oilfields have also been discovered here.

The southwestern region has also proven to be promising, where four new gas and oil deposits have been added just in the current five-year plan. According to estimates of the All-Union Scientific Institute of the Gas Industry, the raw-material base prepared for exploitation here makes it possible to establish a large refining complex.

Another reason it merits attention is the fact that it is situated in an industrially developed area. This means that gas can be considered not only as a raw material for obtaining valuable chemical products but also as one of the most efficient sources of providing heat and power to presently-operating and planned enterprises for mining diamonds, nonferrous metals, and potassium salts in the western part of Yakutia and adjacent areas of Irkutsk and Chita oblasts. That which has been discovered to date suggests that the big discoveries still lie ahead! But we must engage in prospecting and exploration more vigorously and efficiently. For this reason the oblast party committee is keeping an eye on the activities of the geological exploration people, directing the efforts of workforces toward accomplishing key tasks, demanding precise coordination of actions, technical reequipping of the branch, and establishment of a local construction industry base for supporting field operations, providing oil and gas field lines and facilities, and providing people with adequate working and living conditions.

Of course we also are waiting for assistance by the RSFSR Ministry of Geology.

We need stability in supply: where there are no coring bits, core barrels, and geophysical instruments, it means not only that field crews stand idle, but also that unreliable information is obtained from below. We need drilling equipment specifically engineered for the North, vehicles with good off-road capability, and cold-resistant pipe -- these problems are being resolved particularly slowly.

The problem of establishing a solid raw-materials base is followed today, however, by another one -- good-management utilization of that which has already been discovered and surveyed.

On instructions from the party oblast committee, the Lenaneftegazgeologiya Association, jointly with the Yakutsk branch of the Siberian Department of the USSR Academy of Sciences and the Yakutgazprom Production Association, have drafted proposals calling for a sharp increase in natural gas production volume in this republic. This would solve the problem of heat and power supply for the entire Far Eastern Region. Different variations are provided: supply of Yakutsk gas into the Eastern Section of the Baykal-Amur Mainline and to the industrial areas of Khabarovsk Kray and Amur Oblast; utilization of Yakutsk gas at enterprises in Irkutsk Oblast.

Calculations made by the economics section of the Yakutsk branch of the Siberian Department of the USSR Academy of Sciences confirm the considerable effectiveness of any of the proposed variations. A like conclusion was reached by experts at the Institute of Economics and Organization of Industrial Production of the Siberian Department of the USSR Academy of Sciences. Our proposals arouse considerable interest on the part of party committees and the general public in neighboring oblasts, where we also sent

this document. Now it is a matter of nuts and bolts. Who will proceed to implement the project? Not an easy question.

We shall turn for an example to this republic's Aykhal-Udachninskiy Industrial Area, where there is a particularly acute shortage of fuel and energy resources. The Vilyuysk gas is not even meeting the present needs of neighboring enterprises, and yet new ones will be constructed in this area. Even if we take into account movement on-stream of GES-3, which is presently under construction, an electric power shortage is anticipated in this area in coming years. The problem can be solved only by bringing the Yakutsk GRES-2 on-stream, but in order to handle peak loads we must already provide gas service to areas on a priority basis, for more than half the power generated by the Vilyuysk GES in winter is used to heat industry and housing. A natural gas pipeline must be built. But who will do this? We believe that something substantial should be said at this point by USSR Gosplan.

The fields should go into production! Utilization of natural gas has already produced benefits, and not only to Yakutia. We are presently hauling in 300,000 tons of cement, and if local production had not been set up, we would be hauling in twice as much. Natural gas has eased the shortage of electric power in this republic. Provision of gas service to towns and worker communities, as well as further use of gas in producing electricity, in particular accelerated construction of the Yakutsk GRES-2, makes it possible not only to eliminate this problem for close-by enterprises but also for the republic's central industrial region.

The same applies to oil: the country is presently providing Yakutia with 2 million tons of refined product. This represents hundreds of rail consists, tankers, trucks, and thousands of persons employed in loading, delivery, and storage. Petroleum resources in this republic are sufficient to warrant building an oil refinery. Proved reserves warrant commencing production immediately.

Matters pertaining to producing and refining crude oil in the Yakutsk ASSR were worked out in a technical-economic report and received an affirmative decision response from the State Expert Commission of USSR Gosplan. That same year, in 1982, the USSR Ministry of Geology and Ministry of Gas Industry adopted a joint decision to bring the Srednebotuobinskoye field into commercial production on a test basis. While the geologists are in the main handling their end of the job, the gas industry people are taking their time about getting to work: the project paperwork has not yet been done, provision of oilfield facilities and lines is moving slowly, and no decision has been made on a date to commence construction of an oil pipeline to the town of Lensk.

The pace of bringing the field into commercial production on a test basis must be picked up not only for the sake of the crude proper -- it should provide answers to many questions which will arise in the future, with large production volumes. Practical experience here should proceed hand in hand with science. In all fairness we must state that the scientists of Yakutia, the Siberian Department of the USSR Academy of Sciences, and many of this country's academic and branch institutes are displaying considerable interest



in establishing this republic's fuel and energy base. A draft plan for establishment of an oil and gas production base has also been drawn up -- it is now a component part of the Siberian Department of the USSR Academy of Sciences comprehensive program "Oil and Gas of Eastern Siberia." There is also practical participation in workups and studies -- more than 30 academic and branch institutes and higher educational institutions are working in collaboration with the Yakutsk gas and oil people.

But the new stage of the project also requires new forms of interaction. At the suggestion of the party oblast committee, for example, the Ministry of Gas Industry adopted a decision to establish in Yakutsk a combined section of the All-Union Scientific Research Institute of Natural Gas. This will help prepare draft plans more intelligently and with on-the-spot calculation estimates, for oil and gas field development, well drilling, and will help in conducting comprehensive oilfield studies.

Many problems would be clearer on the spot for academy science as well. It is no easy matter to advance such activities without basic research. We are waiting for a decision by the Siberian Department of the USSR Academy of Sciences to establish at the Arctic Mining Institute a department of oil and oil-gas field development.

We have touched upon in this article only problems the resolution of which is a matter of urgency. But the weight of these problems is such that the manpower and resources of just the Ministry of Gas Industry, which is currently assigned the task of development of Yakutia's oil and gas fields, are inadequate to handle them. In addition to strengthening the construction capabilities of the Yakutgazprom Association, construction organizations of the USSR Ministry of Power and Electrification, Ministry of Construction of Petroleum and Gas Industry Enterprises, and the Ministry of Construction in the Far East and Transbaykal Regions must also be enlisted to participate in these projects. And they should be enlisted without delay, for in the final analysis exploration and development of Yakutia's fuel and energy resources is a part of implementation of the party's task pertaining to accelerated establishment of a large new fuel and energy base in Eastern Siberia.

Here too all of us should be guided by a statement in the CPSU Central Committee Accountability Report to the 26th CPSU Congress: "Today, looking forward 5 and 10 years into the future, we should not forget that the economic structure in which our country will enter the 21st century will be built precisely in these years."

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## OIL AND GAS

### MANGYSHLAK OFFSHORE OIL, GAS PROSPECTS CLAIMED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Jun 84 p 2

[Article, published under the heading "Expert's Opinion," by Doctor of Economic Sciences Professor E. Turkebayev, director of the Economics Scientific Research Institute of Planning and Standards under Kazakh SSR Gosplan; and Candidate of Geological-Mineralogical Sciences S. Shalabayev, chief, oil and gas industry development problem sector, Alma-Ata: "Road to the Shelf"]

[Text] Interest in mineral resources on the continental shelf is growing throughout the world. Prospecting and geological exploration activities are in progress, and production operations are being organized. Our country also contains many such regions. We feel that the Caspian Sea shelf zone adjacent to the Mangyshlak Peninsula and Ustyurt Plateau merits particular attention.

The rate of natural gas production on the Mangyshlak Peninsula is presently beginning to decline. The big plastics plant in Shevchenko is already experiencing a shortage of raw materials, especially ethane. At the same time demand for natural gas is growing very rapidly. Development of activities to exploit the Kazakh Shelf zone is assuming particular importance in this connection. Things are moving slowly, however.

A republic Ministry of Geology field unit in the Southern Mangyshlak has discovered the Kansuyskoye and other gas deposits. Marine geophysics has done the preliminary work in the highly-promising, especially for natural gas, Aksu-Kendyrlynskiy-Peschanomysskiy area for deep drilling. It would seem that the impetus has been provided. But the people at the Mangyshlakneft' Association are in no hurry. They consider production of crude to be the main task here, while natural gas is treated as a pariah. Nor does the Ministry of Gas Industry have its own prospecting and exploration organizations here. As a result there is virtually nobody to increase natural gas resources.

The Southern Mangyshlak Depression stands apart with its large area and its known oil and gas accumulations acceptable to production. At its northern edge such well-known fields as the Uzen and the Zhetybay are already in production. The southern and southwestern zones are similar in geologic structure to the northern zone and extend far out under the floor of the Caspian Sea. Highly-promising areas have been discovered here as well -- the

Aksu-Kendyrli, Mangystau-Skalistaya, and others. But certain experts at the Ministry of Gas Industry and the Kasporneft' All-Union Production Association stubbornly insist that prospecting and exploration activities on the Kazakh Shelf should be stepped up only following the discovery of oil pools. This view is dictated not so much by cautiousness as by a narrow interpretation of assigned tasks. And as a consequence of this position, only one drilling brigade is operating throughout this entire vast region.

We feel that it is high time to make a substantial revision in the strategy of development of the mineral resources of this region. The peninsula proper and adjacent areas under the Caspian Sea comprise a single geologic system. And the mineral wealth of the continents and seas should not be viewed separately today. This is in contradiction with geological science, and of course it is not warranted economically.

Today those areas of the Kazakh Shelf where there is a realistic possibility of preparing promising oil and gas resources for commercial exploitation are known. The Ministry of Petroleum Industry conducted exploration activities here in the past. But the volume of exploration work performed is patently insufficient. Nor is the situation improving now that the task has been handed over to the Kasporneftegaz Association and the Ministry of Gas Industry. And it is not at all that development and exploration of these areas is economically less beneficial than other areas. A preliminary comparison eloquently attests to the fact that this is not the case. This is indicated by a geological-economic effectiveness of drilling analysis performed in Azerbaijan, Turkmenia, and Kazakhstan.

What do drilling crews usually encounter? Water depths from 25 to 60 meters or more. Producing zones lie at a depth of 4,500-6,000 meters. Deep drilling must be conducted in very difficult conditions, and this involves considerable capital outlay for each hole drilled.

The situation is entirely different on the Kazakh Shelf. We once flew by helicopter from Shevchenko to Kalamkas. We circled the shallow-water part of the Buzachi Peninsula. From above we could even see the tracks of trucks and tractors extending far out to sea. It is that shallow here. Depths at Aksu-Kendyrli are also modest -- to 20 meters.

The producing formations also lie at a comparatively shallow depth: 1,200-2,000 meters in the Kalamkas, Karaturun, and Morskaya zones, and 3,600-4,100 meters on the Peschanomysskoye Uplift. To this we should add that in this part of the Caspian gale winds almost never occur, and geologic conditions permit rapid-rate drilling.

Preliminary calculations indicate that just two factors -- lower cost of platform construction in shallow water and the comparatively shallow depth of producing zones -- make it possible to save approximately half a million rubles per well drilled, and there should be several hundred in each structure area. In the Kalamkas Field, for example, the plan specifies more than 2,000 wells. Therefore just the first stage of development of two or three similar oil and gas bearing areas will cost the state 2 billion rubles less.

One can only marvel at the generosity of nature and its mineral riches in this region. It is as if nature prepared natural platforms especially for us, the present generation, in the form of the Tyuleni Islands, where exploration drilling can be conducted without building costly trestlework and without employing equally expensive floating rigs. This major potential for savings to the state is estimated at hundreds of millions of rubles.

Oil and gas exploration drilling connected with studying structures adjacent to the Buzachi anticline is extremely promising. These structures are located in Komsomolets Bay. Discovery of promising hydrocarbon reservoirs is anticipated here. A portion of all these reservoirs extends out into the shallow waters of the Caspian. But these pools have not yet been fully delineated and studied by deep drilling.

Yes, prospects for oil and gas are good. And practical experience, the entire experience of developing sources of fossil fuels indicates that existing possibilities cannot be fully exploited if different agencies engage in exploration. This is why we are firmly convinced that it is high time to organize on the Mangyshlak a marine exploration organization subordinate to the Ministry of Gas Industry. A branch of the Institute of Geology and Development of Fossil Fuels of the Ministry of Petroleum Industry and the USSR Academy of Sciences should be established in this republic.

A priority task of specialized organizations is to devise strategy and tactics of development of this region's natural resources. And yet the comprehensive scientific research efforts which are essential for this purpose are only at the very beginning stages. In connection with this we feel that they should be given priority, and this should be done jointly with the Priroda State Scientific Center.

We believe that one of the most important tasks today is acceleration of future investigation to determine the existence of oil and gas in the untouched shelf zone of such uplifts as the Mysopeschanoye, Aksu-Kendyrlynskoye, Mangystau-Skalistoye, the Tyuleni Islands, and the Buzachi anticline zone. The sooner the Ministry of Gas Industry and other interested ministries proceed with accomplishing this task, the sooner this country will start receiving inexpensive oil and gas from the Caspian's Kazakh Shelf.

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## OIL AND GAS

### WAYS OF REALIZING 1984 SOCIALIST OBLIGATIONS OUTLINED

Moscow NEFTYANIK in Russian No 4, Apr 84 pp 10-11

[Article: "Socialist Obligations of Collectives of Ministry of the Petroleum Industry Enterprises and Organizations for 1984"]

[Text] As did the entire Soviet nation, the workers, engineering and technical personnel and employees of the petroleum industry greeted with great enthusiasm the results of the work of the December (1983) Plenum of the CPSU Central Committee and the materials of the Supreme Soviet's ninth session, in which there is a clear expression of the social and economic policies of the party and the Soviet state at the present time.

During the third year of the five-year plan, the oil workers extracted 596.3 million t of oil and gas condensate, which was 3.7 million t more than in 1982, with more than 1 billion m<sup>3</sup> of gas production being above plan.

The branch's drilling enterprises and organizations drilled through more than 25.7 million m of rock, which is more than 10 percent more than was accomplished in the preceding year.

In 1983, the ministry's enterprises and organizations made use of more than 8 billion rubles' worth of capital investments.

In comparison with 1982, fixed capital input increased by 4.2 percent and the amount of uncompleted production was reduced.

Because of the realization of measures to accelerate scientific and technical progress, an economic effect of more than 300 million rubles was obtained. A persistent struggle for the rational utilization of energy resources made it possible to save 1.35 billion kWh of electricity.

About 1.5 million m<sup>2</sup> of living space was constructed and put to use in 1983, along with schools having a total of 11,400 seats and kindergartens with 7,200 seats.

The branch's enterprises' and organizations' subsidiary farms and swine-fattening points produced 12,200 t of meat (live weight), 35,000 t of milk, 100.5 million eggs and 44,400 t of potatoes and vegetables.

The workers, engineering and technical personnel and employees of the petroleum industry, in engaging in the nationwide socialist competition for the successful fulfillment and overfulfillment of the assignments for the 11th Five-Year Plan, being guided by the decisions of the party's 26th Congress and the November (1982), June and December (1983) Plenums of the CPSU Central Committee, and striving to make a worthy contribution to strengthening this country's might, increasing its economic and defense potential, and improving the prosperity of the Soviet people, have assumed the following socialist obligations for the 4th year of the 11th Five-Year Plan.

On the basis of insuring the rhythmic functioning of enterprises, strict observance of the technology for developing fields, better utilization of wells, extensive introduction of the gas-lift method for exploiting wells and high-productivity, submersible, electrocentrifugal units, automation of production processes, reduction of the amount of manual labor done, introduction of crew methods for organizing labor, acceleration of the introduction of new capacities, strengthening discipline, and reducing working time losses:

to increase production output labor productivity per worker by 1 percent over the plan;

to reduce operating costs for oil extraction by 0.5 percent as against the planned figure;

to extract 603.35 million t of oil and gas condensate and 49.2 billion m<sup>3</sup> of gas, including above-plan production of 2.0 million t of oil and gas condensate and 200 million m<sup>3</sup> of gas;

to drill and put into operation 10,046 new oil wells, including 20 above the plan;

to insure the realization of 50 million rubles of above-plan industrial output and obtain 20 million rubles of above-plan profit.

In order to do this, the following things must be done.

#### In the Area of Gas and Oil Extraction and Refining

Reduce labor costs for maintenance per well by 4.1 percent in comparison with 1983.

Because of a further intensification of production and the rational use of raw materials, achieve above-plan production of 60,000 t of stable natural gas, 50,000 t of liquefied gas and 60 million m<sup>3</sup> of gas with the light benzene fraction removed.

Introduce 2,122 wells, including 50 above-plan wells, without any inactivity.

In order to improve the status of oil field development, improve the effectiveness of work done to protect the environment, and use fresh water rationally, increase the volume of oil-industry drainage water used to maintain formational pressure to 925 million m<sup>3</sup>.

#### In the Area of Drilling, Geological Surveying and Geophysical Work

Increase drilling crew labor productivity by 1 percent above quota and, because of this, increase average drilling per crew up to 18,400 m.

Continue the further improvement of geophysical methods for looking for and surveying gas and oil deposits, achieve high quality and reliability of geophysical conclusions and, on this basis, prepare 147 structures for deep prospecting drilling against a planned figure of 145; in order to accelerate the processing and interpretation of industrial-type geophysical data, complete the organization and put into operation 15 collection points for communications with industrial geophysical expeditions and for office communication with the geophysical trusts' computer centers, using VT-20 terminals; by improving the level of organization of geophysical work, increase labor productivity by 1.5 percent in comparison with the plan.

#### In the Area of Construction and Introduction of Production Capacities Into Operation

Achieve in oil industry construction an outstripping increase in the introduction into operational use of fixed capital over capital investments and reduce the volume of incomplete construction to the standard level (51 percent).

Insure the complete outfitting of 10,046 oil wells, including 20 above-plan ones.

Increase labor productivity in construction done by the ministry's construction organizations by 1 percent above the planned level.

#### In the Area of Scientific and Technical Progress

Obtain an economic effect of at least 310 million rubles because of an improvement in the quality of developments made by scientific research and planning institutes, acceleration of their utilization in production, introduction of new equipment and progressive technology, mechanization and automation of production processes, and the utilization of inventions and innovative suggestions.

Using highly efficient bits of the GN, GNU and GAU types, drill 200,000 m (4 percent) more than the plan established for scientific and technological development.

Introduce the type UPT-1-50 equipment for underground and capital well repair at 10 more complexes than established in the plan.

#### In the Area of Oil Pipeline and Motor Vehicle Transport.

Continue to work to improve reliability in oil pipeline transport and the automation and mechanization of production processes.

Insure the release of one ASUP [automated production control system] in the third quarter of 1984 and reduce oil pumping costs by 1 percent as against the plan.

Increase the volume of shipments via motor vehicle transport by 1 percent over the plan by reducing down time and the running of motor vehicles without loads

and improve the loading of transport facilities. Overfulfill by 3 percent the plan for the repair of paved highways in Western Siberia.

#### In the Area of Machine Building and Special Materials Production

Continue to work on improving the quality and operating characteristics of products and insure the following above-plan indicators:

at the enterprises of Soyuzneftemashremont [All-Union Association for Oil Machinery and Instruments Repair]--increase labor productivity by 1 percent, reduce output cost by 0.5 percent, achieve commodity production output in the amount of 900,000 rubles, goods for people's consumption (because of organizational and technical measures) in the amount of 50,000 rubles, and produce 300 t of reinforced concrete goods in order to strengthen Minnefteprom's [Ministry of the Petroleum Industry] construction base;

at the enterprises of Soyuzneftespetsmaterialy [All-Union Association for Special Materials]--realize output in the amount of 900,000 rubles, reduce material costs by 150,000 rubles, increase labor productivity by 1 percent, and reduce production output cost by 1 percent.

#### In the Area of Economy of Material, Fuel and Energy Resources

Save 28,000 t of oil for internal needs; lower the standard for drilling pipe consumption by 6 percent.

Save 1.073 billion kWh of electricity by introducing production processes with lower energy resource consumption, replacing and modernizing production and power equipment, and monitoring strictly the observation of optimum equipment operating modes.

On the basis of an improvement in the planning decisions for the introduction into construction practice of progressive experience, an improvement in production processes, and a reduction of losses and unproductive consumption during the transportation, storage and utilization of construction items and designs, lower the consumption of cement by 5-7 percent, glass by 7-8 percent, soft roofing materials by 3-4 percent and slate by 23 percent.

#### In the Area of Social Development of Collectives

Continue to work to improve oil workers' working, living and leisure conditions, for which it is necessary to: provide for the introduction into use in 1984 of 1.488 million m<sup>2</sup> of living space, schools with 10,168 seats and kindergartens with 8,000 seats; realize 5,000 measures for improving the sanitary and hygienic labor conditions for production work that have a total cost of 9.7 million rubles; produce in 1984 goods for cultural, domestic and economic purposes in an amount 1.1 million rubles more than stipulated for 1985 in the five-year plan.

By bringing to life the decisions of the May (1982) Plenum of the CPSU Central Committee, implement the necessary measures to improve supplying of the working process by creating and strengthening the material and technical base of the ministry's sovkhoses, subsidiary farms and commercial and public dining



enterprises and producing 13,000 t of meat (live weight), 34,500 t of milk, 40,000 t of potatoes and vegetables and 75 million eggs.

In order to provide the branch with highly qualified personnel, send 6,700 specialists with higher and middle special educations to the oil industry's enterprises and then, having satisfied that requirement (particularly for enterprises and organizations in Western Siberia and Western Kazakhstan), train 5,900 people in subdepartmental tekhnikums, improve the qualifications of 5,500 leading workers and specialists in the ministry's centralized network, and train 62,000 new workers and improve the qualifications of 125,000 workers directly during the production process and in professional and technical schools.

The workers, technical and engineering personnel and employees of the oil industry assure the CPSU Central Committee and the Soviet government that, by following the guidance of the decisions made at the December (1983) Plenum of the CPSU Central Committee in their actions, they will exert maximum efforts for the successful fulfillment of the state plans and the socialist obligations they have assumed.

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FORMATION TESTS IN DEEP NORTH CAUCASUS HOLES NEED MORE CARE

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 2, Feb 84 pp 13-17

[Article by A. Ye. Belov and N. F. Ryazantsev (SevKavNIPIneft' [North Caucasus Scientific-Research and Design Institute for the Oil Industry] and F. M. Katsman (Grozneft [Groznyy Oil Production Association]): "Increase Effectiveness in Tests of Deeplying Horizons"]

[Text] Effectiveness in prospecting for and exploring oil and gas fields is governed to a great extent by timely and good-quality conduct of tests of productive sediments when the holes are drilled. This permits information about a stratum's hydrodynamic characteristics and the physical properties of the fluids that saturate it to be obtained and the position of the VNK [oil-water contact] and the deposit's potential to be determined by the time drilling of the hole ends. Obtaining this information enables oil and gas reserves to be estimated and preliminary schemes or designs for developing the deposit to be prepared in a very short time.

The performance of this research becomes especially important in the North Caucasus environment, where holes are being drilled into promising deeplying horizons (down to 6,000 meters) that are marked by high formation pressures (up to 100 MPa) and temperatures (up to 200-250 degrees C). In 1979-1983 the depths of drilled holes and test targets rose by about 700-800 meters (figure 1). As a result, a worsening of the collector properties of sediments that are of interest from the point of view of oil saturation was noted. The technology for drilling-in and testing formations at great depths requires special preparation of the holes.

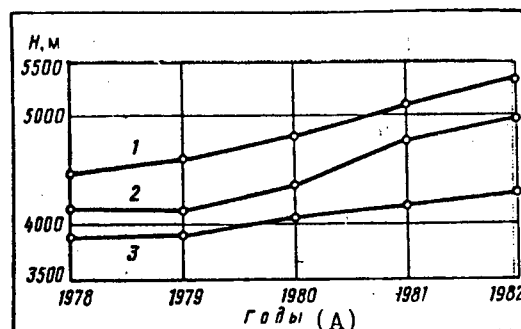
Coring data is of great importance in studying the collector properties and degree of oil saturation of formations. However, coring is not adequate because drilling organizations are poorly supplied with equipment. Thus, in accordance with the designs for drilling holes, actual penetration consisted of about 50 percent coring, and core recovery was, respectively, 32 and 15 percent of the actual and designed penetration. In this case the reliability of singling out and evaluating collectors and their degree of saturation by well-logging becomes of great importance. However, well-logging is difficult in deep wells.

In order to evaluate the quality of the conclusions drawn from well-logging studies, a comparison has been made with the results of drill-stem testing. An

Figure 1. The Distribution of Operations with Tests of Strata Throughout North Caucasus Areas:

1. Average depths of wells drilled.  
2 and 3, respectively. Average depths of tests of targets throughout the Grozneft' Association.

A. Years.



analysis showed that coincidence of the results in terms of the nature of the saturation was 45 percent at depths of up to 5,000 meters, 32 percent at more than 5,000 meters. As a result of the low level of the conclusions from the logging data, three productive deposits were bypassed and 22 targets were tested unjustifiably.

The effectiveness of prospecting and exploratory drilling is also determined greatly by the quality of well-testing during drilling. Studies conducted during 1978-1982 indicated that the quality of tests made by formation testers was greatly reduced. Thus, while in 1978 the number of targets tested or sampled was more than 60 percent, in 1982 it fell to 34 percent. This led to many wells that are being drilled into deeplying horizons being eliminated for geological reasons after tests of the target by ordinary methods on the flow tubing.

Up to 37 percent of the unsuccessful work with test equipment involved failure of the seal of the packing and technological breakdowns of various equipment components, and, as a result of this, it is not always possible to obtain pressure-buildup curves or to take samples of formation fluids. The main causes of lack of seal of the packing were the lack of data on cavernosity measurements, section-gage logging and radius measurements, lack of correlation of drilling-tool size with logging-cable size, and the low thermal resistance of the packing elements. As a result, for two holes alone, five out of nine runs of formation testers proved to be unsuccessful.

For example, in hole No 2 of the Severo-Starogroznskaya area attempts were made twice to test Upper Cretaceous sediments at the 5,545-5,600 meter interval. Both operations were unsuccessful because of lack of seal of the packing (figure 2). After section-gage logging, it was found that actual well diameter at the place where the packer was installed was 145 mm. With a sealer diameter of 130, this provided a permissible packing coefficient (ratio of the diameters of the well and of the packer's seal) of 1.115. However, the drop in pressure should not have exceeded 25 MPa<sup>1</sup>, but it was actually 30 MPa. After changing the site of the packer installation and reducing the pressure drop there to 26 MPa, it was possible to perform the operation successfully and obtain an influx of reservoir water with gas.

<sup>1</sup>Ryazantsev, N. F., Karnaukhov, M. L. and Belov, A. Ye. "Isipyaniye skvazhin v protsesse bureniya" [Well Testing During Drilling]. Moscow, Nedra, 1982.

Figure 2. Results of Installing Packers in Well No 2 of Severo-Starogroz-nenskaya During Test Thereof During Drilling (Bit Diameter Was 130 mm).

- I. Influx of formation water with gas (packer diameter was 135 mm).
- II. Lack of seal of packer (packer diameter was 130 mm).

A. Depth, meters.

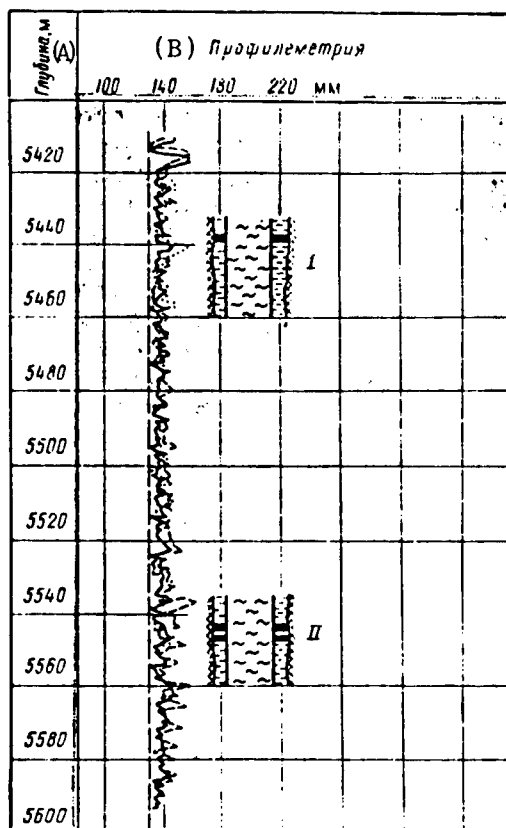
B. Section-gage logging.

Other problems whose solution will reduce the number of unsuccessful formation-tester operations are connected with clogging of various components of the test equipment with the sludge that is found in the drilling mud and with inadequate descent of formation testers to the bottom because of the inability of the drill string, when configured with the test equipment and a stem of great length, to pass through the small diameter of the hole drilled. The latter situation was caused by inadequate studies in the matter of choosing configurations and preparing holes for testing. The proportion of

cited causes is 86 percent of all the technically unsuccessful operations and 23 percent of the total number of formation-tester operations.

Aside from the increase in the number of unsuccessful operations with formation testers, a reduction in the information content of the technically successful operations has been noted, that is, not always by far, even when the full amount of planned research cycles is performed, is it possible to obtain reliable information about the saturation and hydrodynamic characteristics of the deposit being tested. The cause of this is incorrect planning of the technological scheme of the tests. Thus, based upon many years of experience in formation-tester use in North Caucasus areas, theoretical research and statistical generalizations, the following recommendations relative to test-mode technology have been worked out: the time between touchdown and testing of a hole should be minimal (not to exceed 3 days), the interval being tested in an open bore no more than 50 meters thick, the ratio of the drawdown during the test to the pressure buildup during drilling-in no less than 3, and the time of the study varied from 6 hours (for permeated collectors) to 12 hours (for strata without influx).

However, in practice, these recommendations are rarely carried out. For example, during a test of poorly permeable collectors, in only 30 percent of them did study duration exceed 8 hours, as a result of which the work had to be repeated. Often the test is conducted in one cycle, although modern equipment allows many cycles to be executed.



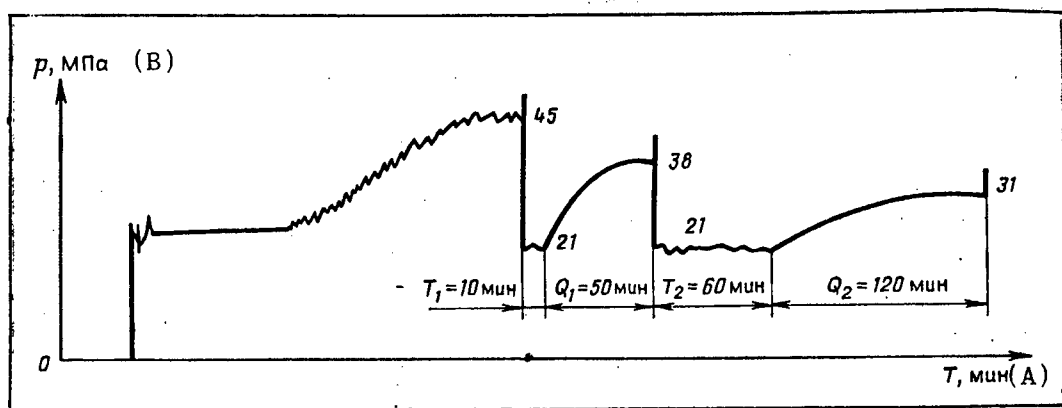


Figure 3. Pressure Diagram Recorded During Test of Triassic Sediments in Hole 124 of Zimnyaya Stavka.

T and Q are, respectively, the time of the influx and the time of pressure buildup.

A. Minutes. B. p, MPa.

The desirability of conducting two- and three-cycle tests can be illustrated by the following examples. A test of limestones of the Neftekum suite of Lower Triassic sediments in hole No 124 of Zimnyaya Stavka of Stavropol'neftegaz (Stavropol Oil and Gas Association) after a set of geophysical research was proposed for execution in two cycles, with open periods of, respectively, 10 and 60 minutes, closed periods of 50 and 120 minutes, where the ratio of drawdown to pressure buildup was more than 2.5. During the test a weak influx was noted (according to a discharge of air from the pipes). Pressure diagrams were of the form shown in figure 3, from which it was evident that the pressure during the second closed period was less and was being restored more slowly than during the first. Taking this into account, and, on the basis of geophysical research, it was concluded that the formation was practically impermeable in the interval tested.

Foraminiferal sediments in hole No 253 of Oktyabr'skaya of Grozneft' Association were tested in three cycles with a total duration of 15.5 hours. During this time, 3.5 m<sup>3</sup> of oil with gas were withdrawn. The pressure diagrams recorded a reduction in pressure at the end of each closed period from 61.6 to 53.5 MPa. A careful interpretation of the test results let it be established that the formation was productive but the permeable zone was restricted and was being exhausted rapidly, so the target was not of commercial value.

Repeat tests were held on flow tubing in both wells. Lengthy attempts to cause an influx from the strata, using repeated acid treatments, failed to bring positive results, but neither did they refute the negative evaluations made for these formations during the testing thereof during drilling.

Formations that are subjected to test often are drilled in with an excess of hydrostatic pressure from the drilling-mud column in the well above the formation pressure of up to 20 MPa. This, on the one hand, greatly worsens the

collector characteristics in the bottom-hole zone, and, on the other, creates equipmental and operating difficulties during conduct of the tests. Thus, during a test of limestones of the Valanginian stage in well No 19 of the Arak-Dalatarak area of the Grozneft' Association that lasted 185 minutes, no influx from the formation was obtained. An analysis of the pressure diagrams indicated that the drawdown in the formation was about 4.2 MPa with a buildup of more than 20 MPa, that is, the ratio of these values proved to be unsatisfactory, and the test had to be repeated after change in the drilling mud's specific gravity in accordance with the formation pressure measured. With increase in the drawdown to 13.5 MPa, an influx of oil with gas with a flow rate of 85 m<sup>3</sup>/day was obtained.

The drilling in of formations with great counterpressure on the part of the drilling-mud column is explained by the rather complicated geological structure of the North Caucasus area being drilled over. An inadequate degree of study of the hydrodynamic ties among the various Mesozoic sediment horizons and among area blocks and the whole field and the great difference in formation-pressure gradients in the cross-section being drilled through necessitate the use of weightened drilling muds. Because of this, when drilling into the roof of promising sediments, a control measurement of the formation pressure is necessary for adjusting for the specific weight of the drilling mud and for supplying optimal conditions for later touchdown and testing.

The time during which the drilled-in formation is affected by the drilling mud exerts a great influence on worsening the collector properties of the stratum's bottom-hole zone, and, consequently, on the test results. Generalizations of statistical data that we had produced previously showed that with continued (more than 3-4 days) of influence of the drilling mud on the drilled-in formation, the quality of operations with formation testers is greatly reduced: the probability of obtaining an influx is halved. Because of this, testing of large intervals (more than 30 meters) is undesirable, since their upper portion is under the influence of the drilling mud for 10-20 days, as a result of which the collector properties of the more interesting portion of the tested horizons in the bottom-hole zone are worsened. Moreover, where there are great intervals of the test, it is very difficult to take a representative sample of formation fluid and to evaluate unambiguously the degree of saturation of the whole interval in the various horizons. It is for this reason that up to 30 percent of the technically successful operations that use formation testers require repeating in order to refine the data on degree of saturation and on the collector properties of the formations which are part of the large interval of the test.

Thus, an analysis of operations with formation testers at areas of the North Caucasus that are marked by a more complicated geological-engineering environment showed that prospecting and exploratory drilling effectiveness can be increased by observing the following recommendations.

1. Targets for tests should be chosen and a preliminary evaluation of their collector properties in holes being drilled should be made on the basis of a careful analysis of the results of geological and geophysical research, including an analysis of coring and sludge, mechanical, gaseous, standard and

side well-logging, and section-gage logging or radius measurements, and, additionally, in Lower Cretaceous and Jurassic sediments, gamma logging.

2. In the drilling-in of promising sediments, it is necessary first to take control measurements of the reservoir pressure in the roof of those sediments by means of formation testers and make touchdown only after adjustment for the specific weight of the drilling mud in accordance with the pressure measured.

3. Poorly permeable collectors should be tested in one or two cycles with a total duration of open and closed periods of, respectively, 3-4 and 6-8 hours, with a drawdown of 18-20 MPa; and the ratio of drawdown to repressuring should be no less than 3.

4. The thickness of the interval tested should not exceed 30 meters.

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METHOD FOR CONTROLLING TURBODRILL MECHANICAL SPEED EXPLAINED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 2, Feb 84 pp 17-20

[Article by A. A. Lyubavin (TyumII [Tyumen Research Institute]): "Mechanical Speed of Turbodrilling as a Function of Control Parameters"]

[Text] Mechanical drilling speed depends upon a large number of geological-engineering factors: axial load on the bit, the bit's rotating frequency, the consumption of drilling mud and its quality and the speed of its discharge from the bit's nozzle, standard sizes of the turbodrill and bit, torque and specific moment on the bit, the hydrostatic, hydrodynamic and differential pressure at the bottom hole, the design of and wear on the bit, the physico-mechanical properties of the rock, the energy intensiveness of destroying rocks, and so on.

The modern theory of identification recommends that those input parameters that exert the greatest influence on the parameters being controlled and are independent or responsively computable be chosen as the control parameters. For turbodrilling these include axial load on the bit  $P$ , bit rotating frequency  $n$ , and drilling-mud consumption  $Q$ . The  $P$  and  $Q$  parameters are independent. Moreover,  $n$ , as a rule, is not observable (in the absence of a tachometer), a fact that does not allow it to be included in the basic control parameters. Thus,  $P$  and  $Q$  will henceforth be considered as the basic control variables. Of these,  $P$  changes responsively over a broad range. Consequently, basic attention should be paid to determining the dependence of the mechanical penetrating speed  $v$  on the bit's axial load when  $Q$  does not change. The joint effect of  $P$  and  $Q$  on  $v$  can be evaluated for a drive with smoothly regulatable drilling-fluid consumption.

Experiments were performed in a well in the Verkhniy Salym area. After the bit break-in procedure, the statistical dependence of  $v(P)$  at the bottom hole in homogeneous rocks of unvarying  $Q$  was plotted by a stepped variation in  $P$ 's level, and  $v$  was determined at each level. The load on the 215.9-mm diameter bit was increased to 240 kN. The tests started from a depth of 2,000 meters, a bit with milled cutting structure (SGV) being used for nonabrasive or mildly abrasive rocks, a bit with a nondulling cutting structure (SZGV) for abrasive rocks. Because of this, tooth wear did not affect the test results, and tests were rejected when the bit was transferred to another rock. All the bits were raised from the bottom hole because of bearing wear, indicating the slightness of abrasiveness of the rocks. The latter were



represented by argillites, aleurites and sandstones with resistance to cave-in at the first destructive shock of, respectively, 200-560, 230-950 and 200-780 N/mm<sup>2</sup>, enabling them to be considered as soft and average-strength rocks.

Mechanical drilling speed is determined from the expression  $v = \Delta h' / \Delta t$ , where  $\Delta h$  is the increase in penetration and  $\Delta t$  is the time increment, it being considered that  $\Delta h = \text{const}$ . Since the instantaneous  $v = dh/dt$ , in order to avoid large error when converting  $dh'/dt \rightarrow \Delta h/\Delta t$ ,  $\Delta h$  must be made as small as possible. However, in the given case, the effects of uneven tool feed, the drilling string friction on the well's walls, and so on, are manifested, as a result of which measurement error is increased. Therefore, five measurements ( $r = 5$ ) were made for each level of  $P_i$ , and it was found that

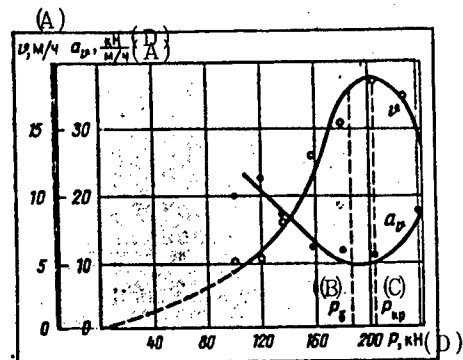
$$v_i = 1/r \sum_{k=1}^r v_k = 1/r \sum_{k=1}^r \Delta h / \Delta t_k = c/r \sum_{k=1}^r 1/\Delta t_k, \quad i=1,2,\dots, \quad (1)$$

where  $c = \Delta h = \text{const}$ .

A typical function of  $v(P)$  where other drilling conditions do not vary is presented in figure 1. It has a clearly expressed maximum. Time for plotting this curve was about 30 minutes.

Figure 1. Functions of  $v = f(P)$  and  $a_v = f(P)$  That Were Obtained During the Drilling of Hole R-22, Beginning from a Depth of 2,118 meters.

- A. Meters/hour.                      D. kN.  
B.  $P_{\delta}$ .  
C.  $P_{kr}$ .



Let us introduce the concept of the base drilling mode, to which the minimum of the indicator  $a_v = P/v$  corresponds. Let us name the axial load that corresponds to minimum  $a_v$  as the base load and designate it  $P_{\delta}$ . It is assumed that the drilling mode under which  $v_{\text{max}}$  is reached is considered the critical one. The indicator  $a_v$  signifies the rock's capacity to resist destruction. The essence of introducing it consists of the following:

The effectiveness of the rock-destruction process can be determined by the level of specific energy intensiveness of the process [1 and 2]

$$A_v = N_n / Fv, \quad (2)$$

where  $N_n = k_1 M_n \omega$  is the power on the rock-destroying tool;  $F$  is the area of the well's bottom hole;  $k_1$  is the coefficient of proportionality;  $M_A = M_0 + M_{yA} P$  -- the torque on the bit [4 and 5];  $M_0$  is the moment that is spent overcoming the forces of resistance and does not depend upon the load; and  $M_{yA}$  is the specific moment.

According to V. I. Kurepin's data,  $M_0$  is comparatively small, then  $N_n = k_1 M_0 P n$ . It follows from this that

$$A_v = \frac{k}{F} \frac{Pn}{v}, \quad (3)$$

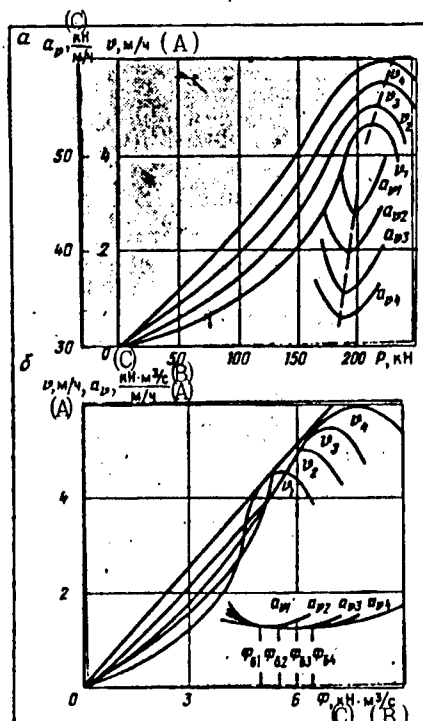
where  $k = k_1 M_0$ . The ratio  $k/F$  can be considered fixed, since it varies insignificantly in time during drilling in homogeneous rock, and also during shift of mode. Consequently,  $a = \frac{F}{k} A_v = \frac{Pn}{v}$ . In the vicinity of the base point, at which  $P$  practically does not vary, and it can be considered with small error that  $n = \text{const}$ , then  $a_v = P/v$ . The necessity for determining such a point was pointed out in works [3, 5 and 6].

In order to evaluate the effect of both control parameters ( $P$  and  $Q$ ) on  $v$ , drilling-mud consumption was regulated by change in the diesel's rpm, by throttling. A function  $v(P)$  was constructed for each  $Q$  (figure 2a) and the basic drilling mode was determined. The time spent plotting the curves  $v_1$ ,  $v_2$ ,  $v_3$  and  $v_4$  was, respectively, 1.5, 1.3, 1.2 and 1.1 hours, the total time of the experiment was 5.1 hours, and the run time was 6.2 hours. The bit was lifted with wedged supports and with unworn cutting structures. It is apparent from figure 2a that as  $Q$  increases,  $P_{kp}$  and  $v$  rise, which does not contradict the data of other research.

Figure 2. The Functions  $v = f(P)$  and  $a_v = f(P)$  (in a) and  $v = f(\phi)$  and  $a_v = f(\phi)$  (in b) for Various  $Q$ 's Obtained During the Drilling of Hole R-22, Beginning from the 2,303-Meter Depth ( $Q_1 = 0.027 \text{ m}^3/\text{s}$ ,  $Q_2 = 0.30 \text{ m}^3/\text{s}$ ,  $Q_3 = 0.032 \text{ m}^3/\text{s}$  and  $Q_4 = 0.035 \text{ m}^3/\text{s}$  correspond to values for  $v_1$ ,  $v_2$ ,  $v_3$  and  $v_4$ ).

A. Meters/hour. C. kN.  
B. Meters<sup>3</sup>/second.

During turbodrilling, when  $P \approx \text{const}$ , the turbine's rpm is directly proportional to  $Q$  [5]. Consequently, in the expression  $a_v = Pn/v$  in the vicinity of the base point  $n$  can be expressed through  $Q$  and  $a_v = PQ/v$  obtained. Let us introduce for examination a generalized control parameter  $\phi = PQ$  and let us construct a function  $v(\phi)$  for every  $Q$  (figure 2b). It is apparent from figure 2b that in the changed range of  $Q$ , the points that correspond to the base drilling modes (let us call them local base modes) lie on practically a straight line constructed from the origin of the coordinates tangent to the  $v(\phi)$  curves. For all the local base points  $a_v$  is practically identical:  $a_v = \phi_0 / v_0 = \text{const}$ . It follows from this that



$$v_{\phi} = k' \phi, \quad (4)$$

where  $k' = 1/a_v$ .

It follows from expression (4) that the function  $v_{\phi}(\phi)$  can be considered linear within certain limits of change of  $Q$ . In particular, it is linear for the section  $\phi_{\min} \phi_{\max}$  ( $\phi_{\min} = Q_{\min} P_{\min}$ ;  $\phi_{\max} = Q_{\max} P_{\max}$ ; and  $P_{\min}$  and  $P_{\max}$  are the base axial loads, respectively, for  $Q_{\min}$  and  $Q_{\max}$ ).

Various levels of  $Q$  are recommended for the West Siberian environment: from low-volume levels ( $Q = 0.018-0.020 \text{ m}^3/\text{s}$ ) to high-volume levels ( $Q = 0.040-0.050 \text{ m}^3/\text{s}$ ) levels. With such  $Q$ 's, the values  $\phi_{\min}$  and  $\phi_{\max}$  during the drilling of average rock ( $P_{\phi} = 170-200 \text{ kN}$ ) would be, respectively 3.6 and 8.5  $\text{kN}\cdot\text{m}^3/\text{s}$ . For soft rocks ( $P_{\phi} = 100-120 \text{ kN}$ ),  $\phi_{\min} = 2.2 \text{ kN}\cdot\text{m}^3/\text{s}$  and  $\phi_{\max} = 5.0 \text{ kN}\cdot\text{m}^3/\text{s}$ .

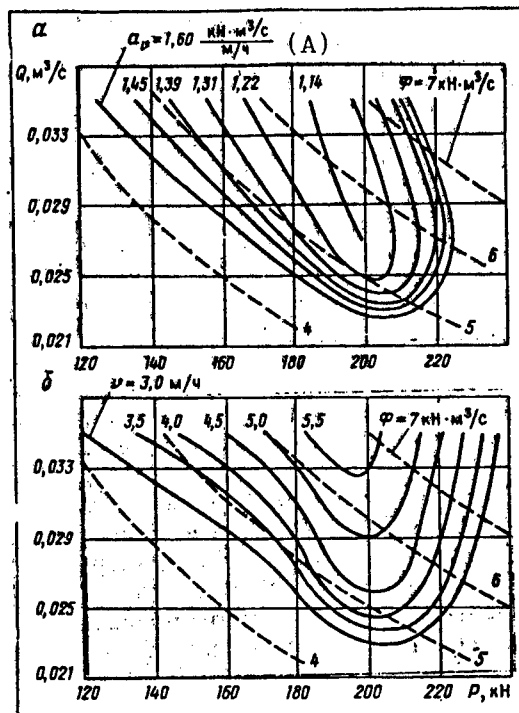
Studies of the  $v(\phi)$  function which were made with fixed and varying  $Q$  indicate that in the first case the function  $v(\phi)$  is nonlinear, and, in the second case it can be hypothesized as linear during drilling in the base mode under certain conditions of change of  $Q$ , which is a function of the specific drilling conditions. The conclusion about the linearity of  $v_{\phi}(\phi)$  should simplify considerably the identification of a model of the process of rock destruction during turbodrilling.

The characteristics of the process of deepening a hole as an object of control are presented in figure 3. Given  $\phi$ , one can find the minimum of  $a_v$  or a maximum of  $v$  with change in one of the control parameters,  $P$  for example. This is feasible where the pumps are smoothly regulatable over a broad range of drilling-mud circulation.

Figure 3. Characteristics of the Process of Deepening a Hole by Turbodrilling Where

$a_{vi} = \text{const}$  (in a) and  $v_i = \text{const}$  (in b).

A.  $\frac{\text{kN}\cdot\text{m}^3/\text{s}}{\text{m/hr}}$



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WATERFLOOD COVERAGE OF PRODUCTIVE STRATA STUDIED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 2, Feb 84 pp 32-35

[Article by R. N. Diyashev and N. S. Matsiyevskiy (TatNIPIneft' [Tatar SSR Scientific-Research and Design Institute for the Oil Industry]): "Evaluation of the Coverage of Productive Strata by Waterflooding"]

[Text] Two categories of perforated collectors are singled out in accordance with the results of an analysis and the generalization of data from a study of wells with instruments for deep measurement of flow: those that do not take part completely in development, and those that operate only with a portion of the perforated thickness. If a stratum does not accept the injected water or does not yield output, then it is difficult to draw conclusions about the possibility of working its reserves. The share of such strata at the Romashkino field is 40-45 percent of those perforated. Depending upon collector characteristics, they can occupy any portion, in terms of thickness, of a producing stratum.

For example, in the Vostochno-Suleyevskaya area, the a and g strata of the D<sub>1</sub> horizon are represented by the best collectors and a major portion of them are participating in development. The share of participation of the remaining strata in the operation of injection holes or of producers is much lower (see the table). In the Minnibayevskaya area, a large number of the nonoperating perforated collectors are in the upper strata a,  $\delta_1$ ,  $\delta_2$  and  $\delta_3$ . It is obvious that the development of methods for drawing the indicated types of collectors into active operation is one of the most important tasks for increasing oil withdrawal.

In this work, an evaluation was made of the coverage of the working of oil reserves that are concentrated in the collectors which are the operating portion of the perforated thickness.

Work [1] indicated by three different indirect methods, including the ratio of the reserves withdrawn and the initial recoverable reserves, that the actual coverage of the waterflood of a formation that worked a portion of a perforated thickness was 10-30 percent higher in some portions of the Romashkino field than had been established by measurements by deep flowmeters and flow recorders. The data of a generalization of oilfield information for the Kuleshovskoye, Mukhanovskoye and Yablonevskoye fields also indicated that coverage of the

Stratum	Number of strata exposed by perforations in wells for		Strata taking part in development, during			
	Injection	Recovery	Injection		Recovery	
			Number	Percent	Number	Percent
a	122	381	107	87.7	343	90
$\delta_1$	63	166	33	52.4	86	51.8
$\delta_2$	55	117	31	56.4	71	60.7
$\delta_3$	80	225	46	57.5	127	56.4
B	29	97	15	51.7	51	52.4
$\Gamma$	8	34	8	100	24	70.6

strata is 57-100 percent in terms of thickness, while flow measurements evaluate it at 24-61 percent [2].

The published data on laboratory experiments and mathematical simulation also testify to the possibility of practically complete coverage by waterflood of strata that are operating over part of a perforated thickness. This is explained by the complicated processes of the crossflow of liquids between inhomogeneous intercalations of the collector at the displacement front as a consequence of the manifestation of capillary, gravitational and hydrodynamic forces.

Back in 1962 the results of experimental work on two-layer models indicated that, along with the lateral movement of fluids, intense crossflows occur between layers, forming stable, uniform, shifting displacement fronts under certain conditions [3]. The fact that the water front should move practically uniformly in the less permeable intercalations, with a thickness of no more than 0.5 meter, was substantiated by transference of the experimental data to conditions that are close to the actual ones.

These conclusions were further developed and confirmed by the results of a laboratory experiment on a three-layer model [4]. According to this research, the influence of the capillary forces on the displacement was so great that there was practically no significance in whether the water was being injected across the whole input section of the model or only in a definite layer, regardless of the position along the thickness. The water enters poorly permeable layers through a highly permeable intercalation in the presence of capillary forces. Moreover, the intercalation serves as an outlet for oil that arrives in the counterflow. This is confirmed by larger total withdrawal of crude from highly permeable intercalations and lesser total withdrawal from poorly permeable intercalations in comparison with their initial reserves.

Work [5] presents the results of numerical simulation of the process of displacing oil by water for a stratum that consists of 20 thin intercalations of various permeabilities that are situated along the thickness randomly and consistently with the increase in permeability toward the roof or the bottom. The variation coefficient of permeability was assumed to be 0.85, the thickness of the intercalations 0.76 meter. The calculations used the results of laboratory research on the determination of capillary pressure and relative

permeability. Three variants in displacement speed (0.04, 0.159 and 0.635 m<sup>3</sup>/day) were examined, where the relative mobility was 0.5 and 5.0. It was established that the waterflood process occurs in a stratum with intercalations whose inhomogeneity is random in terms of their permeability as it does in a homogeneous collector of absolute permeability of average shape equal to the intercalations of the inhomogeneous system. The displacement characteristics are well described in accordance with the Buckley-Leverett theory of immiscible displacement.

The results of a detailed study of the lithology and structure of the pore space of the coring material from the Romashkino field's D<sub>1</sub> productive horizon testifies to the possibility of extrapolating the enumerated conclusions of the laboratory research and mathematical simulation to the actual flow processes in the collectors. The strata are actually represented by a random alternation of thin-layered intercalations of various impermeabilities and are complicated by grains of varying fractional compositions, density and packing. The average permeability value for 1,175 determinations was 0.492 microns<sup>2</sup>, and the square of the variation coefficient was 0.920 [6].

New data on determination of the coverage of strata by flooding was obtained during a study of wells drilled in zones flooded by injected water. For this purpose, the method for monitoring water encroachment of oilfields that is based upon reporting peculiarities in flow processes in the well's zone of oil-saturated and waterflood collectors that was developed by TatNIPIneft' and was put into operation was used. This method enables determination of the thickness of a collector that is oil-saturated and flooded by nonmineralized water. Sandstone strata that experience the active effect of the developmental system being applied and have not been involved in operation stand out among the oil-bearing strata in the intensity of oil flow and in change in saturation in the collector's pore space.

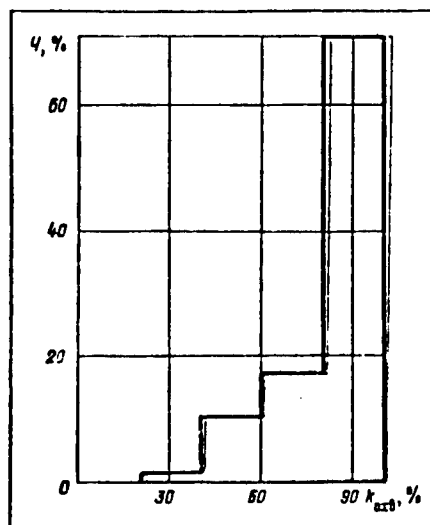
In order to evaluate the degree of coverage by the displacement process, the data of a study of 158 strata intersections in 72 wells that were drilled in flushed zones at Tataria's fields were analyzed. The collectors were represented by sandstones with a porosity of 18-23 percent and a permeability of 0.2-1.5 microns<sup>2</sup>.

The analysis showed that 87 (55.1 percent) of the strata were flooded by injected water, 60 of them throughout the collector's whole thickness, that is, the coverage coefficient of their waterflooding in terms of thickness  $k_{ox\Delta} = 100$  percent (see the figure). For confirmation of these results, 20 strata were perforated and they all yielded injected water. Partially flooded were 27 strata for which  $k_{ox\delta}$  varied from 25 to 85 percent, with an average value of 61 percent.

The intervals that remained oil saturated were located in the roof portion of the strata. Perforation and later sampling of 15 strata of this group enabled oil that was 25-50 percent water-encroached to be obtained from them. Studies of the degree of change in extent of saturation of these collectors indicates that they have been drawn into development and are experiencing the active influence of injection. In this connection, it should be expected that the oil reserves that are contained in the roof of such strata will be recovered

Chart of the Coverage Coefficient of Strata by Waterflooding  $k_{oxB}$ , Which Was Constructed in Accordance with the Results of Drilling New Wells in Waterflooded Zones of Fields ( $\eta$  is relative frequency).

under the existing developmental system, and coverage of the strata by waterflood throughout the thickness will, with time, be complete. The range of variation in thickness of the collectors that were waterflooded completely or partially coincide, being 1-15 meters. A study of  $k_{oxB}$  as a function of effective thickness of the productive stratum that is under development indicates that as it increases,  $k_{oxB}$  rises.



Oil-saturated sandstones represent 71 (44.9 percent) of the strata, and 36 of them are in zones of active working of reserves: oil flows intensely within these collectors. It should be expected that in time they also will be flooded with injected water. The other 35 oil-bearing sandstone formations have not been drawn into development. The results of the research that has been conducted indicated an absence of flow in these collectors' intervals. After perforation and mastery, oil was obtained from 23 oil-bearing formations, 12 of which were covered by the flow process and 11 had not been brought into development.

An analysis of the geological field data indicated that the wells that touched down and had not been brought into development of the stratum basically were screened from the action of the injection rows and were located in lenses and dead-end zones. Although a portion of the wells are located in active injection zones, the other oil-saturated strata are of insignificant thickness (thicknesses vary from 1 to 6 meters, 80 percent of the holes being 1-4 meters) and low in productivity. Where there are multiple-strata deposits, they have not been drawn into development at injection and offset recovery wells. It is obvious that these strata's oil reserves will be removed only by improving and intensifying the existing development system.

Thus, studies of wells that have been drilled in flushed sections of fields that are being developed and an analysis of oilfield data showed that 38 percent of the stratal intersections studied had been flooded by injected water with full coverage in terms of thickness. Forty percent of the strata were waterflooded with partial coverage or were still oil saturated. In the region of the wells that exposed these strata, flow also occurs, and, with time, they will be covered by the waterflood. Under the existing system of stimulation, 22 percent of the stratal intersections have not been brought into development.

The results presented should be considered when evaluating final coefficients of oil withdrawal, substantiating the desirability of doing scientific



research and practical work on smoothing out injection and influx profiles, isolating various highly water-encroached strata or intercalations within a single formation, and so on. They are especially important because they point to the existence of residuals beyond the displacement front, that is, in the stratum's flushed zone that had not been drawn into development of the oil reserve and thus serve as justification for drilling additional wells in these sections.

#### Conclusions.

1. Studies of wells drilled at waterflood sections of working strata have indicated waterflood coverage throughout the whole thickness of the collectors that have been drawn into development under the existing system of stimulation.
2. About 22 percent of the stratal intersections studied in waterflood zones under the existing system for stimulation have not been covered by the flow process. These strata can be brought into operation only by improving the development system (the drilling of infill wells, increase in injection pressure, changes in flows, and so on).

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## OIL AND GAS

### TATAR OIL UNIT BOASTS ABOUT GOOD ORGANIZATION OF WORK

Moscow EKONOMICHESKAYA GAZETA in Russian No 19, May 84 p 14

[Article by N. Khamidullin, deputy general director for Economics of Tatneft' Association (Almetyevsk): "Special Collective Effort Based upon a Single Work Order"]

[Text] From the experience of Tatneft' [Tatar Oil Production Association] in economic work.

Since the start of the five-year plan, Tatneft' has recovered more than a million tons of crude oil and gas condensate above the plan. The consistent work of the association's enterprises has been achieved in no small degree by improving planning and organization of work.

The whole system of plan-evaluation indicators that were established by various production subunits and teams is aimed at accomplishing the main task--increasing the amount of crude oil recovered at reduced cost. For example, drilling enterprises are to establish such indicators as the introduction of new wells and the amount of oil recovered from them and the operating mode of the wells at the time they are turned over for operation. We obtain the main gains when rhythmic turnover of wells for operation is achieved and uncompleted operations are sharply reduced. While previously wells operated an average of 3 or 4 days during the month of startup, under the new conditions they give crude for 11-14 days.

Introduction of the brigade form of organization and of incentives for labor promotes steadiness and regularity in the work. Every other collective in the association has converted to cost accounting.

Oil-recovery brigades are receiving work-order assignments that show all the cost-accounting plan indicators. Oil-recovery facilities are assigned to the brigades, the qualifications of workers for the planned amounts and types of work are determined, and the appropriate number of technicians are allocated. The total of the plans of brigades and of oilfield subdivisions are balanced with the oil-recovery goal for the whole administration.

An accounting of the work of each person is kept by brigade collectives. On this basis, a coefficient of labor participation is derived. The interests of all members of brigades and of oilfield sectors as a whole are united in

the drive to achieve the final result--an increase in the recovery of crude. This affects positively the quality of servicing of the wells. Expenditures for the operation of one well have been reduced by an average of 957 rubles per year.

Brigade cost accounting is being introduced also for underground well repair. Cost-accounting brigades are driving for a reduction of idle time of wells awaiting repair and an increase in operating time between repairs. In so doing, a common area for servicing wells is assigned to oil-recovery and underground-repair brigades. The evaluative indicators of brigade operations are determined in accordance with the final product--the amount of oil recovered.

Such an organization of the work permits the competition of allied collectives to be organized more efficiently and the prerequisites for work incentives for brigades to be created. In the 3 years that have elapsed since the introduction of cost accounting in underground-repair brigades, the number of repeat repairs for the association has been cut in half, and the arrears in crude because of idle time of wells awaiting repair have been reduced 25 percent. And well-operating time between repairs has been increased by more than 10 percent.

The activity of transport enterprises has been set to depend directly upon the final result--fulfillment of the oil-recovery plan. The reporting of and pay for the work of crews, teams and individual drivers are made currently on the basis of consolidated standards. This has enabled accounting and the setting of standards to be simplified and such an evil in transport as inflated reports to be prevented. As a result, a large amount of transport and special equipment has been released for other work.

Right now the association is working on further improvement of brigade cost-accounting in drilling and derrick-erecting and in all subunits that perform auxiliary operations. For drilling and derrick-erecting brigades and for brigades that complete and case wells, new plan-evaluation indicators that stimulate acceleration of operations and reduction in expenditures have been developed. A policy of consolidating cost-accounting brigades has been undertaken. Let us say that, while previously 6-9 men worked in well-overhaul collectives, now there are as many as 40. Under these circumstances all the special collective efforts are being made under a single job order, with payment for the final result--a well turned over after overhaul.

For the first time in the association, consolidated brigades have begun to operate at the Aznakayev Drilling Administration. Overhaul quality has been improved, and now all the consolidated brigades here are coping with the task. Expenditures for eliminating accidents and defects have been reduced by more than 40 percent. Almet'yevsk Administration repair workers have already followed the example of the Aznakayevers.

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## OIL AND GAS

### AZERBAIJAN FLEXIBLE HOSE FOR OILFIELDS HAILED

Baku VYSHKA in Russian 18 Apr 84 p 3

[Article by I. Vekilova: "The Point of Support? Science."]

[Text] In the competition for the Azerbaijan SSR State Prize.

General-purpose flexible superstrong pipe has been created and introduced.

It actually has been created. Serial output of this product, which is based upon fiberglass and rubber, has started at the Mingechaur Industrial Rubber Products Plant. The oilfield workers' long-standing dream about flexible pipe is no longer merely a fantasy. Here it is, a flexible, very lightweight length is in the palms of my hands. And no special effort is needed to bend it. This synthetic flexible hose is rolled up jellyroll-like and winds around a drum at the oil well. And it is not necessary to screw and unscrew kilometers of steel pipe during performance of the most varied technological operations--inherent parts of oil-recovery technology.

Machine operator Aliyusif Kurbanov, who is alone at the panel, controls the operation of the specially designed automated line. I watch as the rotating axle "holds in one harness" seven miniature out-of-round machine units. The pipe is braided at once on each of them in turn by several belts, thus acquiring its inimitable multiple-tier ornamental appearance. Then automatically the newly formed flexible pipe (hose) is turned over on the rack, and next, on command of the same automated mechanism, it is sent to the boiler, into the "crater" for vulcanization. The next length of finished general-purpose flexible superstrength hose capable of holding great internal pressures plus an axial load leaves the automated line, and the oilfield workers are already waiting for it.

Before me is a statement that notes specifically the steps for manufacture and practical use of the flexible nonmetal pipe at one of the promising sectors of the republic's economy--offshore oil recovery. VPO Kaspmorneftegazprom [All-Union Caspian Offshore Oil and Gas Production Association], APO Azrezinotekhnika and the Institute of Mathematics and Mechanics of the Azerbaijan SSR AN [Academy of Sciences] are executing this integrated program. Its fulfillment presupposes industrial approval of the basically new approach to the construction of underwater trunk and oilfield-facility pipelines. And this is only one of the steps.

It is very difficult to describe the scale of use of flexible nonmetal pipe in the national economy today, for the replacement of rigid metal pipe by flexible pipe that is based upon reinforced polymer materials is one of the urgent problems of modern technology.

"The most important areas of scientific and technical progress are the automation of production, the introduction of flexible automated systems, and the use of new constructional materials. Work in the area of creating general-purpose flexible nonmetal pipe also helps the solution of these tasks. It can be said that this development by scientists and engineers of the Institute of Mathematics and Mechanics of the Azerbaijan Academy of Sciences, being the result of basic research, has opened up a new and promising scientific and technical area"--these are the words of Khalil Akhmedovich Rakhmatulin, Academician, Hero of Socialist Labor and Manager of the Department of Wave and Gas Dynamics of MGU [Moscow State University] imeni M. Lomonosov.

Let us recall that the "Main Directions for Economic and Social Development of the USSR During 1981-1985 and During the Period up to 1990" named as one of the most important problems the development of mathematical theory and its utilization precisely for applied purposes. And, of course, for the scientists, this became a program directive.

Several years ago the Institute of Mathematics and Mechanics of the Azerbaijan Academy of Sciences obtained extremely important results in basic research in the area of the mechanics of structurally inhomogeneous media. It would seem that this should have completely satisfied the scientists. However, their efforts were aimed at developing a scientific and technical plan. The result was a great success: they created basically new theoretical bases for analyzing and designing flexible nonmetal pipe. Then, in close creative collaboration with engineers, analytical schemes and a set of basic designs were developed.

But let us return to the plant. How was the introduction started? Scientists, engineers and blue-collar workers literally with their own hands manufactured the first test models. Experiments showed that the theoretical and engineering calculations were irreproachable. Then there was the first experimental lot of flexible pipe: 1,000 meters, which was sent to Kaspormorneft' [Caspian Offshore Oil Production Association] for use.

"You know, of course, what this pipe means generally for the oilfield workers," says NGDU [Oil and Gas Recovery Administration] imeni 50-Letiya SSSR chief and Hero of Socialist Labor Bakhtiyar Mamedovich Mamedov. "As for the flexible pipe--oilfield workers actually have always dreamed about it. On receiving the lot of new pipe, they at once put it to use. The economic benefit from the use of this lot during underground repair and well overhaul was 298,000 rubles in 1978."

But can the flexible pipe be manufactured also at other industrial-rubber products plants? The test plant of VNIKTIRP [All-Union Scientific-Research and Industrial Design Institute for the Rubber Industry] of Volzhsk, manufactured jointly with production workers and shipped a new lot of the pipe--1,000 meters of it--for operation.

But now the scientists are giving some thought to the technology itself: can its productivity be increased? As quickly as possible, the Institute of Mathematics and Mechanics, APO Azrezinotekhnika and VNIIRTmash [All-Union Scientific-Research and Design-Development Institute for Machinebuilding for the Industrial Rubber Products Industry] of the USSR Ministry of Chemical and Petroleum Machine Building jointly developed, manufactured, installed and checked out at the RTI [industrial rubber products] plant at Mingeaur a new, highly productive automated wastefree industrial line that has no counterpart in the world.

I ask deputy plant department chief Yashar Guseynov: how much flexible pipe has been manufactured on this line?

"In 1983--5,000 meters, which has already been sent to the operators. This year we are preparing to make 30,000 meters of this new product."

I watch as the line operates smoothly on the adjusted program and I think, what enormous work the scientists and engineers have done to coordinate and solve in the various ministries, agencies and branch institutes a multitude of questions which at times were extremely complicated and connected with organizing series production. For manufacture of the test lot and introduction of the new technological line into operation were not called for in the plans for introducing new machinery at the Mingeaur RTI Plant. And although there is concern here about plan fulfillment, the production workers still tried to find reserves for this important matter.

And so still another goal was undertaken which, it would seem, has been reached--serial output has been mastered.

However, a no less difficult task still lies ahead of the scientists and production workers. In 1983 alone more than 300 agencies, organizations and enterprises of such Union ministries as those of the petroleum, gas and coal industries, ferrous metallurgy, agriculture and many others appealed to the institute with their needs.

It became clear--our national economy needs the flexible pipe very much. But here is what is interesting: practically each of the requests required the most varied engineering properties of the pipe. These tasks can be coped with only if one is armed with new theoretical bases for analyzing and designing the nonmetal pipe created by the scientists and engineers.

While this report was being prepared I spoke not only with prominent scientists and well-known oilfield workers but also with many engineers and blue-collar workers. And everyone was unanimous in the opinion that the work, "The Development of the Theoretical Bases for the Analysis and Design of Nonmetal Pipe on the Basis of Fiber Structures and the Introduction of Them into the National Economy," whose authors were F. G. Maksudov, A. A. Il'yushin, G. G. Aliyev, Ya. A. Gadzhiyev, V. I. Turubarov, A. A. Nasirov and S. M. Tagiyev, deserve the award of the Azerbaijan SSR State Prize.

\* \* \*

....I was reminded of the philosophical thought of Archimedes, who concluded in his well-known words: "Give me a point of support, and I will turn the whole world." Today, science has reached that level in its development where it is in our life a point of support and a lever for it, which strengthens the union with practice, toward the reinforcement and intensification of which the party constantly directs us.

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## OIL AND GAS

### FUTURE EXPANSION OF LITHUANIAN OIL REFINERY FORESEEN

Vilnius SOVETSKAYA LITVA in Russian 28 Mar 84 p 1

[Article by Ya. Rivkin, chief design engineer of Orgtekhstroy [Trust for the Industrialization of Construction Work]: "Mazheykyay Looks into the Future"]

[Text] New tasks and new goals for construction of the oil refinery.

At the meeting, which was devoted to startup of the second phase of the Mazheykyay Oil Refinery and, let us say it frankly, to a celebration, still another important event occurred. At the site of the social center of the new microrayon, Neftyaniki, the builders placed a commemorative capsule in the foundation of their Palace of Culture, the erection of which had already started. This will be a permanent palace, with halls for audiences and dancing, and with numerous rooms for club work. The builders are to solve major tasks also at the main production site: put into operation this year complexes for gas-fractionation, installations for obtaining elemental sulfur and purification structures for Mazheykyay city that are due for early startup.

But the main thing for the local trust still is to provide for successful preparation for construction of the refinery's third phase. It can rightly be called special, and qualitatively new. The accounting report of the CPSU Central Committee to the 26th Party Congress said: "...an increase in the production of crude oil yields little if a substantial part of it will be burned in the form of mazut instead of being used for obtaining more valuable types of fuel and petroleum product or for increasing export resources." In considering this, the construction of a large installation for the severe refining of mazut, the second in our country, is to start in 1985.

What will such an installation yield? It will enable mazut, which is produced at the plant's first and second lines, to generate a substantial amount of light petroleum product. In other words, the country's economy will obtain more gasoline, diesel fuel, liquefied gases and raw material for carbon production from the crude oil that arrives at the enterprise today.

Aside from construction of the new installation for the severe refining of mazut, it is planned to create a large production facility for hydrogen, a nitric acid station and an installation for obtaining elemental sulfur. The



reactant activity and the road, utility and service grid will be greatly expanded. Much attention is being paid to nature conservation measures: the capacity of the closed water recirculating cycle will be expanded, and six additional water-cooling towers will be introduced. Despite the growth in capacity, the amount of water discharged after cleaning will not only not be increased but will be decreased.

There are large unused reserves for thermal energy at the refinery. Finally, this problem is being resolved: this year construction will start on a large greenhouse combine that will provide Mazheykyay residents with fresh vegetables. It would seem that it will not be excessive to think also about promoting a network of fish-breeding ponds. The large amount of warm water will enable the city to be supplied with fresh fish throughout the year.

The deadline for introducing into operation the installation for severe mazut refining has already been set--1987. The standard time for building such a complex is 43 months. What is worrying everyone right now, primarily, is--who is to do what is planned? First of all, how to provide for the thorough implementation of site preparation. Indeed the average annual amount of work that is to be done will exceed 2-fold to 2.5-fold the amounts realized during the erection of the refinery's second line.

The working drawings for the new complex are now being developed by the appropriate design institutes of Moscow, Leningrad and Groznyy. The specifics are such that the installation itself is being designed first, and then the services and utilities grid! How can good site preparation for construction be provided under these conditions? Obviously, this question requires additional examination.

Petroleum refineries are distinguished from many other enterprises by the fact that the process of developing them, and that means also their construction, is literally continuous. So it is that the outlook is discernible many, many years ahead. Therefore, it is desirable to erect at the plant site a building for meeting the everyday needs of 1,000-1,500 builders and installers to be sent there. This is economically more advantageous than the erection of temporary buildings each time.

SOVETSKAYA LITVA readers who have followed the progress of the refinery's construction know that cranes with lifting capacities of 75, 100 and 300 tons were used during installation of the equipment for the second line. This cut the time for doing the work 2-fold to 3-fold. This is a new opportunity for increasing the pace now on the next phase: transfer the assembly of heavy equipment to machinebuilding plants, delivering it to Mazheykyay in finished condition.

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## OIL AND GAS

### NEW GAS PROCESSING SYSTEM DEVELOPED FOR URENGOY

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 5, May 84 pp 32-33

/Article by I. S. Nikonenko and A. V. Yazik, All Union Urengoygazdobycha Production Association imeni S. A. Orudzhev, UKNIiPE: "Urengoy: New Gas Dehydration and Cooling Systems"/

/Text/ Tests of new gas dehydration and cooling systems at the Urengoy Field have shown that the injection of diethylene glycol (DEG) into the pipeline ensures the necessary level of dehydration for both warm and cold gas, while the expansion turbine is a reliable and effective means of gas cooling.

In 1983, the first domestic turbine gas cooling station was built at the Urengoy Gas Field (UKPG-4). Due to the lack, at that time, of sufficient gas pressure drop, one gas-cooling process circuit was tested. This, however, does not reduce the practical value of the test results.

This process circuit is equipped with a DEG-injection system into the gas flow (fig 1). A filter-separator is provided in the system to trap the saturated DEG. The first stage of the filter is a cartridge wrapped with a nonfabric material. The second stage is made of fluoroelastic elements designed by UkrNIIgaz /Ukrainian Scientific Research Institute for Gas/.

The DEG (99 percent concentration) is injected through 4 centrifugal nozzles at a pressure of 10 megapascals (MPa) against the 8-MPa gas flow. The distance between the DEG injector and the test filter-separator is about 100 meters.

The system test was conducted at positive (282-287 degrees Kelvin (K)) and negative (272-266 K) gas temperatures. Before the test, the DEG was drained from the absorber, the separators and filters were blown out and the process line was operated for a while without drying the gas. This ensured that no DEG remaining in the main line would affect the test results.

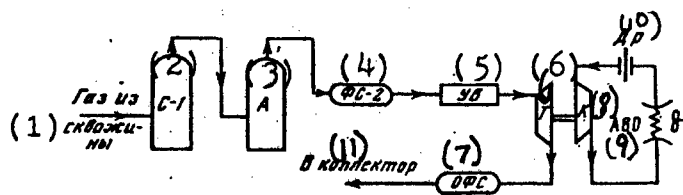


Figure 1. Diagram of the Process Line for Gas Cooling and Dehydration

Key:

- |                               |  |
|-------------------------------|--|
| 1. Gas from the well          | 7. Test filter-separator                 |
| 2. 1st stage separator        | 8. Compressor for expansion turbine unit |
| 3. Absorber                   | 9. Air cooling unit                      |
| 4. 2nd stage filter-separator | 10. Regulator                            |
| 5. Regenerated DEG injector   | 11. To the collector                     |
| 6. Expansion turbine          |  |

The tests showed that injecting 99 percent DEG in quantities of 10-12 liters per 1,00- cubic meters dried the gas to a dew point of 253 K or lower; the test filter-separator trapped practically all of the saturated DEG; the first stage trapped about 90 percent of the liquid.

At present, research is being conducted to determine the operating parameters of the system during the summertime, the possibility of using a lower DEG concentration, the feasibility of two-stage DEG injection, as well as the industrial operation of the system.

The BTDA-5-100 KhL expansion turbine unit operated for about 800 hours at various gas cooling rates. The compressor unit operated in a closed loop containing the gas air-cooling unit (Fig 1). This compressor circuit, when the gas air-cooling unit serves as the load for the expansion turbine, can be implemented at the first stages of gas-field development, when the free gas pressure drop  $R_{et} \geq 2$  MPa.

Future gas cooling stations should be designed as shown in Fig 2.

The specific gas temperature drop  $\Delta T / \Delta P$  in the expansion turbine, which depends on the thermoinsulation properties of the gas and on the expansion turbine efficiency, characterizes the efficiency of the gas cooling process. The temperature drop was equal to, depending on operating conditions, 5-10 K/MPa at minimum nozzle angles, 5.5-7 K/MPa at maximum nozzle angles and 7.5-8.6 K/MPa at optimum angles. Changes in the quantity and viscosity of the DEG injected into the gas flow at the expansion turbine inlet had no noticeable effect on the unit's operation.

The technical and economic indicators of the cooling-turbine gas cooling station will be determined basically by the size of the auxiliary compressor station, which compensates for the gas pressure drop produced by the expansion turbine unit. The gas cooling station process parameters and the size of the auxiliary compressor station depend on the air temperature (Fig 3).

In the decompression period, the gas temperature at the cooling station inlet fluctuates within the range 282-287 K during the station's operating season (mid-April to mid-November), while the gas temperature at the expansion turbine inlet is in the range 273-310 K. The air temperature varies from 262 to 288 K, reaching a maximum (298 K) for several days in July. Incomplete recovery in the air-cooling unit is equal to 10 K. Beginning with the 3rd year of the compressor period of gas field development, the gas temperature at the gas-cooling-station inlet will be the same as at the expansion turbine inlet.

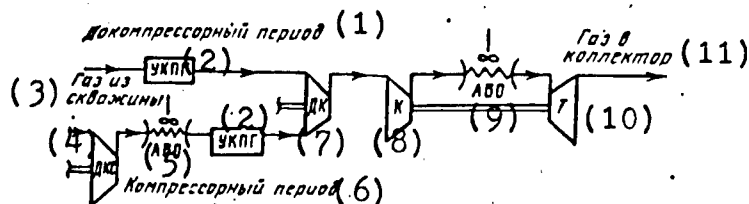


Figure 2. Basic Diagram of the Cooling-Turbine Gas Cooling Station

Key:

- |                                 |                          |
|---------------------------------|--------------------------|
| 1. Precompressor period         | 7. Auxiliary compressor  |
| 2. Complex gas-preparation unit | 8. Compressor            |
| 3. Gas from the well            | 9. Air-cooling unit      |
| 4. Auxiliary compressor station | 10. Turbine              |
| 5. Air-cooling unit             | 11. Gas to the collector |
| 6. Compressor period            |                          |

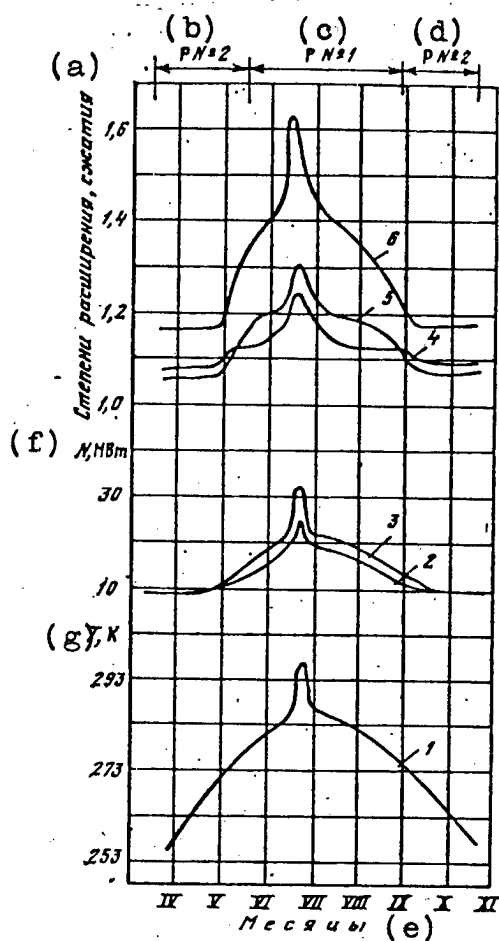
The data given in fig 3 are for a cooled-gas temperature of 271 K, a pressure of 7.5 MPa and a gas cooling station capacity of 90 million cubic meters per day.

As the data show, all the characteristic gas cooling station operating indicators change over the course of the season.

In order to ensure that the rubomachine operates efficiently, a rotating nozzle must be used in the expansion turbine, as well as two interchangeable rotors.

If one allows for the possibility that the gas pipeline will operate during the several hottest days in June with a positive pipeline-gas temperature, then the technical-economic indicators of the gas cooling station are significantly improved. The maximum power of the auxiliary compressor station is reduced to 22 megawatts, which makes it possible to get by with a GPA GNP-16/100 operating unit and one standby 10-megawatt unit. The cooling station will use 23 million cubic meters of fuel gas per season in the precompressor period and 26 million cubic meters in the compressor period of gas-field development.

The pumps for the gas cooling station auxiliary compressor station must be designed for a working pressure of up to 10 MPa; pumps for the expansion-turbine unit, for pressures up to 13 MPa. These conditions are satisfied by the UKhL4 BTDA-10-13 expansion turbine unit, which has passed test-stand testing.



Key:

- a. Expansion, compression ratios
- b. Period No 2
- c. Period No 1
- d. Period No 2
- e. Months
- f. N, megawatts
- g. T, K

Figure 3. Gas Cooling Station Indicators

1. Ambient air temperature
2. Gas cooling station capacity in the precompressor period
3. Gas cooling station capacity in the compressor period
4. Compression ratio of the auxiliary compressor station of the gas cooling station
5. Compression ratio of the expansion turbine unit compressor
6. Expansion ratio of the expansion turbine

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## OIL AND GAS

### BRIEFS

KUTKASHEN, TBILISI GAS SUPPLY--Kutkashen--The collective of the Kutkashen Gas Operations Office is providing the rayon's workers with liquid fuel--gas in tanks. It is used these days in all the rayon's villages, including the most remote and highest in the mountains. Our services are also being used by more than 150 Chaban families at winter pasturelands which are located in Kyurdamirskiy and Udzharskiy Rayons. And the number of customers grows each year. In the first quarter alone we sold and delivered to the rayon's populace more than 200 tons of liquid gas, which is 5 tons above the plan. The collective's members--workers A. Osmanov, R. Kyazimov, A. Dzhalilov and others--are doing everything possible to satisfy customers. Still another gift is being prepared for the populace--a line that will deliver the "blue fuel" direct to apartments of the rayon's residents is being laid to Tbilisi and to Kutkashen from Ardash, from the trunk gas pipeline. [Text] [T. Yusifov, engineer of the rayon's Gas Operations Office] [Baku VYSHKA in Russian 4 May 84 p 1] 11409

SHIRVAN GAS, OIL OPERATIONS--Ali-Bayramly--The drilling brigade of foreman Aliikram Gasanov of the Ali-Bayramly UBR [drilling administration], skillfully using at Shirvan oil and gas fields innovations of equipment and technology for sinking wells and advanced methods of brigade organization of the work, turned over eight wells to workers of the field's facilities, having drilled for this purpose a total of 20,570 meters of rock--as much as was planned for the brigade for the 11th Five-Year Plan. It is important that the advanced collective, which is operating stably, with hardly any change in its makeup, has saved about a million rubles since the start of the five-year plan. And productive time has exceeded 92 percent for the brigade. Right now the drillers are contemplating new goals in the competition to raise the effectiveness and quality of the work. [Text] [A. Babayev] [Baku VYSHKA in Russian 19 May 84 p 1] 11409

KOMI'S 200-MILLIONTH TON--Syktyvkar--Kombineft' [Komi ASSR Oil Production Association] oilfield workers have recovered the 200-millionth ton of liquid fuel while developing the Komi Republic's oilfields. This success is the result of increasing operating time between repairs, intensification of flow of the liquid to the well faces, and more complete extraction of the raw material from the deposits. Nizhnyaya Odessa oilfield workers are laboring especially successfully, having pumped more than 100,000 tons of above-plan fuel from the ground since the start of the five-year plan. [Text] [Yu. Kovrizhnyy] [Moscow SOVETSKAYA ROSSIYA in Russian 24 Apr 84 p 2] 11409

NATURAL-GAS AUTOMOTIVE FUEL--Chelyabinsk--The saving of motor fuel is acquiring ever-increasing urgency today. One of the basic solutions of this problem is the conversion of motor vehicles from gasoline to natural-gas fuel. Trucks equipped with tanks for gas and special fixtures can convert to the new type of fuel without rebuilding the engine. Gas filling stations do up to 500 refuelings per day. One refueling suffices for 200-300 kilometers of travel. [Text] [L. Mikhaylov] [Moscow STROITEL'NAYA GAZETA in Russian 9 May 84 p 3] 11409

UDMURT GAS-PIPELINE SECTION--Mozhga (Udmurtskaya ASSR)--The laying of pipe on the Udmurt section of the Urengoy-Central Economic Region Gas Pipeline No 1 has been completed. Yesterday the "red" joint was welded, 3 months ahead of schedule. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Mar 84 p 1] 11409

RYAZAN-BUILT GAS TANKS--Ryazan--Equipment with the Ryazan Automotive Equipment Plant label enables natural gas to be used more completely as a fuel. The gas does not have to be brought to the liquefied state. The enterprise has started the serial output of tank units in which the gas is fed at high pressure. As tests of an experimental group of motor vehicles have indicated, the fuel is more effective, and atmospheric pollution is reduced to a minimum. One fill of a tank is enough for a 300-km run. The enterprise plans to produce 200,000 such sets per year. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Mar 84 p 1] 11409

BALTIC OFFSHORE OUTLOOK--The drill that has been reaching for an oil-bearing formation at the Baltic Sea shelf has approached the 2,000-meter level. The commentary of the chief of Kaliningradmorneftegazprom [Kaliningrad Offshore Oil and Gas Production Administration] V. S. Zakutskiy: "Today, 13 oilfields have been discovered on Kaliningrad soil, and 8 of them have been linked up to the oil-gathering system. But exploration that has analyzed the structure of the layer that bears the oil has predicted that in the future deposits will also be found under the water, by the very shores of the Baltic Sea, where Kaliningrad Oblast leaves off. That is why stationary platforms have appeared on the sea shelf. They are similar to those that are used for drilling wells in the Caspian." [Text] [Tamara Karyakina] [Moscow SOVETSKAYA ROSSIYA in Russian 4 May 84 p 6] 11409

RAIL TANK-CAR CLEANER--Khabarovsk--A new technology for the rapid cleaning out of solid paraffin that has built up in oil tank cars has been developed by production workers and the Far East's scientists. It was introduced at the steam-cleaning station of the Khabarovsk railroad terminal. The tank cars, set up on a specially equipped platform, are filled with steam. It turns hard residues into liquid, which is poured off into a chute, is separated from the water and goes through a filter to purification structures. After a second heating by a heated coil that has been laid at the bottom of the chute, the paraffin is pumped out into a collector tank car. "In a year, up to a thousand tons of valuable raw material are now returned for processing," says deputy chief of the Far Eastern Railroad Administration's car service. "The steam station cleans up to 900 tank cars per year. In this way, the amount of Siberian oil hauled has been increased." [Text] [TASS] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 25 Mar 84 p 2] 11409

ABOVE-PLAN CRUDE SHIPPED--Syktyvkar--The autonomous republic's oilfield workers have reached a high labor goal. The 200-millionth ton of crude recovered since the start of the fields' development has been sent for refining. Since the start of the year, customers have received 30,000 tons of raw material above the plan from here. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 6 Apr 84 p 1] 11409

KOMI OIL OUTPUT INCREASING--Syktyvkar--The republic's oilfield workers have recovered 200 million tons of crude since the start of development of the field. In 1929 about 5 tons of oil were taken from underground here, but now 52,000 tons are being recovered. Oil derricks have become an integral part of the landscape not only in the old Ukhta oil region. The new Usinsk and Vozeyk fields have been discovered and are at work. Oilfield worker villages connected up by good roads and electric-power lines have risen up where previously there were swamps. And the drillers are going ever farther into the taiga and tundra. The well-drilling pace has risen sharply. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Apr 84 p 1] 11409

NIZHNEVARTOVSK BUILDING-MATERIALS PLANT--Nizhnevartovsk (Tyumen Oblast)--The reinforced-concrete structure plant that is being built here will speed up the development of fields that are difficult of access. The erection of a second building for the enterprise has started. The plant will produce 80,000 cubic meters of road slab and piles annually. It will produce its first output this year. [Text] [Moscow TRUD in Russian 19 Apr 84 p 1] 11409

TAJIK OIL-RECOVERY PLANS--Dushanbe--The collective's counterplan calls for Tadzhikneft' [Tajik Oil Production Association] to exceed the annual recovery of gas by 10 million cubic meters and of crude oil by several thousand tons. It is estimated that this will yield additional production worth 325,000 rubles, or an increase in output per worker of 1.7 percent. In order to accomplish this, a special plan that consists of 30 measures was worked out. Thus, it is planned to convert low-flow wells to mechanized oil recovery, and gas wells will be overhauled. Moreover, oil and gas field workers have given their word to introduce newly discovered sections into operation ahead of schedule. Another aspect of the matter is an additional reduction in prime production costs. The conversion alone of flowing and of gaslift wells to pumping and the economical expenditure of thermal-energy resources will enable production outlays to be reduced by about 35,000-40,000 rubles. The advanced collective right now is outrunning the production schedule with assurance. [Text] [P. Laptev] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Mar 84 p 1] 11409

PLANS FOR TURKMENISTAN GAS--Ashkhabad--The Sovetabad gas-condensate field in the south of Turkmenistan, the largest in Central Asia, is working on the five-year plan. The state commission has accepted for operation an oilfield-facilities complex that has a capacity of 5 billion cubic meters of raw material per year and was due for early startup. Sovetabad's gas will travel over the Central Asia-Central Economic Region pipeline. The builders are to expand the buildup of the oilfield's facilities now. The Sovetabad field and the introduction of new oilfield facilities in the Karakumy will help Turkmenistan's gas recoverers to achieve the fuel-recovery level planned for the end of the five-year plan--81 to 83 billion cubic meters per year. [Text] [TASS] [Moscow IZVESTIYA in Russian 2 Apr 84 p 1] 11409



AZERBAIJAN OILFIELD WINS COMPETITION--The challenge Red Banner of the USSR Ministry of Petroleum Industry and the central committee of the industry's trade union was awarded to Azneftestroy [Azerbaijan Trust for the Construction of Oil-Industry Facilities] for first quarter results. Oilfield and construction workers fulfilled with honor the plan and socialist commitments in all technical and economic indicators. [Text] [Baku VYSHKA in Russian 8 May 84 p 2] 11409

NEFTECHALA OILFIELD DRILLERS LEAD--The brigade of drilling foreman Seidgasan Kyazimov was first in the Neftechala UBR [drilling administration] to report fulfillment of the task for the first 4 years of the five-year plan. Altogether since the start of the five-year plan, the advanced collective has completed the drilling of and turned over 15 oil wells to the oilfields's workers. Twelve of these were turned over ahead of schedule. The introduction of a progressive way of organizing the work--the brigade contract--helped in the success. After the conversion to cost accounting last year, the brigade completed the touchdown of 5 wells and saved, in so doing, more than 50,000 rubles. Answering with deeds the decisions of the December 1983 and February and April 1984 CPSU Central Committee Plenums and the instructions contained in Comrade K. U. Chernenko's speeches, the advanced workers committed themselves to completing the drilling this year of 6 wells and to bringing productive time during their drilling up to 97 percent, and they are filled with resolve to keep their word. [Text] [D. Gezalov, chief of the Work and Pay section of the Neftechala Drilling Administration] [Baku VYSHKA in Russian 6 May 84 p 1] 11409

SECOND HUNDRED MILLION EASIER--Ukhta (Komi ASSR), 6 Apr--The 200-millionth ton of oil since the start of commercial development of local Komi ASSR fields has been recovered. While almost half a century was required to extract the first 100 million tons of liquid fuel from the autonomous republic's soil, the next 100 million tons were obtained much more rapidly. The collectives of all four oil-and-gas recovery administrations of Komineft' [Komi ASSR Oil Production Association] competed for the right to participate in the recovery of the landmark ton of raw material. [Text] [PRAVDA stringer A. Kurkov] [Moscow PRAVDA in Russian 7 Apr 84 p 1] 11409

CASPIAN OIL-HAULING--The crews of many ships of the Caspian Steamship Line who took on increased commitments after the December 1983 and February CPSU Central Committee Plenums are hauling cargo in excess of the plan. The competition in honor of the 60th anniversary of the USSR Maritime Fleet, which will be observed this year, will help in achieving the high indicators. Seamen of the tanker "Nurek" committed themselves to greeting the anniversary with good labor indicators. They planned to haul 7,000 tons of petroleum product above the plan. Their word has been backed up by deeds. During the 22d voyage since the start of the year, about 2,000 tons of petroleum product above the plan have been hauled and more than 50 hours of operating time have been saved. The crew's personnel have done 1,500 rubles' worth of repair work and saved much fuel material. Good upkeep of the ship's machinery and hull by the crew has enabled operation of the tanker, which has now sailed the Caspian for 21 years, to be prolonged. [Text] [M. Mamedov] [Baku VYSHKA in Russian 13 Mar 84 p 1] 11409

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## NUCLEAR POWER

### PLAN FOR NEW ODESSA ATET'S REVIEWED

Moscow ENERGETIK in Russian No 5, May 84

/Article: "At the Scientific and Technical Council of the USSR Ministry of Energy: The Odessa ATET's"

/Text/ The Scientific and Technical Council reviewed the technical plan produced by the Gorkiy Branch of the Atomteploeletkroproyekt /nuclear heating and power design/ Institute for the Odessa nuclear central heating and power plant /ATET's/.

It has been proposed to install two power generator units with a capacity of 1000 MW each. A generator unit will include: one water-moderated water-cooled type VVER-1000 power reactor, with a thermal capacity of 3000 MW, and two type TK-450/500-60 steam condensation-central heating turbines of 500 MW each with steam parameters of 60 kgf/cm<sup>2</sup> at 274.3 °C and with TVV-500-2YeUZ generators. Each generator unit of the ATET's has a two-loop configuration.

Incoming water is superheated in two basic steam superheating turbines with a range of pressure regulation of 0.4-2 kgf/cm<sup>2</sup> at the lower yield, and 0.6-3 kgf/cm<sup>2</sup> at the upper yield. A third stage is still envisaged to superheat water up to 145 °C with steam of 8-10 kgf/cm withdrawn after the TsVD /not further identified/. The central-heating factor adopted is 0.5.

The hot water is transported by two supply and two return conduits with a diameter of 1000 mm over a distance of 25 km.

Startup of the first generator unit is scheduled for 1988, and of the second for 1990. The plan for the Odessa ATET's, which is the first power plant in a series of nuclear heating and power plants, has opened a new path in the country's central heating by using large-capacity condensation-central heating turbines that have no counterpart either in the USSR or abroad.

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## PIPELINE CONSTRUCTION

### DEPUTY MINISTER OUTLINES SECTOR'S SOCIAL PROBLEMS

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 84 pp 2-5

[Article by A. P. Vesel'yev, deputy minister, USSR Ministry of Construction of Petroleum and Gas Industry Enterprises: "With Concern About People"]

[Text] The party is taking a decisive course towards the more complete satisfaction of Soviet people's social needs and directing all economic efforts towards the solution of our plans' main socio-political goal -- improving the people's standard of living. General Secretary of the CPSU Central Committee, comrade K. U. Chernenko, pointed out: "It is equally important to now ensure the ever closer interaction of economic, social and spiritual progress in Soviet society. It is impossible to lift the economy up to a qualitatively new level without creating the essential social and ideological prerequisites. It is equally impossible to solve urgent problems in the development of socialist consciousness without a firm foundation in economic and social policies." The program for the social development of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] is also oriented towards this goal, taking into consideration the specifics of a dynamic sector.

The rapid rates of petroleum and gas construction, the severe natural-climatic conditions in its main regions, the operation of powerful equipment and the modern technology used all require high skill levels from its workers and engineers. Concurrently, at this stage social factors are increasingly definitive in successful solutions to production problems. Their effect increases with the national economic importance of these production-economic tasks.

The main goal for the sector's social development program has been presented. It is to supply petroleum and gas construction with stable and skilled key personnel on the basis of improvements in all facets of their life activities, the more complete satisfaction of workers' material and spiritual needs and to educate them in a communist attitude towards labor. This is essentially a comprehensive goal. Its various aspects involve the implementation of specific tasks by the program.

The most vivid result of activity to control the sector's social development is the reduction of cadre turnover and increased stability of collectives. The social development program called for at least a 4 - 5 percent reduction in cadre turnover during the five-year plan. This has, for the most part, been done.

In spite of the more difficult conditions for petroleum and gas construction, cadre turnover is now at the average level for capital construction. In the developing regions of West Siberia cadre turnover indicators are often lower than for the European part of the country. At the same time, reserves for improving collective stability are far from exhausted. Relying exclusively upon central recruitment, some trusts are not doing the necessary work with young people. Every year about half of the collectives at such trusts are replaced. The core of the cadre is retained, but a sizable share of the new people works less than a year. Studies show that this happens most frequently at ground and residential construction trusts (Priuralneftegazstroy [Urals Petroleum and Gas Construction], Trust No. 2 of Soyuzgazpromstroy [Gas Industry Construction] Association, the Tyumen DSK [Housing Construction Combine] and others. Apparently, in such organizations the general level of production, organizational-managerial relations and economic incentives do not correspond to the demands made upon a modern construction enterprise. First of all, however, it indicates an underestimation of social work's importance, insufficient concern about people and their needs. In addition to cadre costs, it frequently leads to the nonfulfillment of production targets.

Working conditions have a great influence upon cadre turnover. The five-year plan called for substantial improvements in working conditions at thousands of work places, the lightening of women's working conditions and the elimination of a large number of heavy jobs. Working condition improvements are to a considerable degree attained through accelerated technical progress. Petroleum and gas construction is rapidly moving towards automation and mechanization. However, some types of work, especially in residential construction, still require large outlays of manual labor. Petroleum and gas construction working conditions are greatly determined by the dispersed and linear character of operations, where a significant percentage of work is done far from cities, in developing regions. Practical experience has developed and scientists have optimized special working and off-duty conditions, based on extended work days and cycles. These have the most potential for improving working conditions. Research at VNIIST [Scientific Research Institute for the Construction of Petroleum and Gas Enterprises] has shown that a precise schedule for extended working days, timely breaks and regular meals at the work site can provide about a 20 percent increase in work capabilities and reduce fatigue of welders, machinery operators and drivers at pipeline operations. By no means have all trusts introduced the necessary order into work organization and conditions.

The sectorial Statute on the expedition and temporary method has solved many problems in improving social and living conditions of line construction. It has a definite procedure for estimating additional outlays involved with adding up work and travel time. It has worked out suitable conditions of labor and rest appropriate to construction technology and has eliminated many difficulties in planning the number of temporary duty personnel. Ministry organizations have been given state plans for the introduction of the expedition and temporary duty method. However, trusts and main administrations are still not giving sufficient attention to the improvement of working conditions. Summary accounting of work time is being introduced slowly and there is a great deal of hidden reworking. From a social development perspective the expedition and temporary duty method,

and regularity and order in line workers conditions are the directions for the long term provision of high quality labor resources for mobile petroleum and gas construction. It can be the basis for protecting the health of cadre and extending their labor activity.

Minneftegazstroy collectives are highly mobile. Experience has shown that when necessary, field camps can be set up near the new project or line section for 2 - 3 months and a solid construction infrastructure created. The ministry now has a strong material base for mobile social infrastructure. In the past 3 years alone 24,000 modern trailer houses and housing complexes, primarily built by the ministry itself, have been delivered. More than 1,000 field camps have been set up. Conditions are good at many of them. One of the results from the systematic work on developing and improving field camps is that the majority of operations managers understand that living conditions on the route and comfortable camps have a direct effect upon the achievement of production goals. From their personal experience, key workers know that it is fully possible to have contemporary living and cultural conditions at field camps.

There is widely known positive experience in the construction of field camps: for example Lengazspetstroy (Zubova Polyana), the Tatneftestroy Association (Pomarskaya), the welding and installation trust (Uzhovka), the Krasnodar-truboprovodstroy Trust (Okhochevaka) and others. The camps of these organizations have normal conditions for rest. There are Red Corners and clubs, recreation rooms and sports areas. The cafeterias provide the builders with nutritious food and deliver meals to the line. Cultural work is conducted and public organizations are active. The rooms are comfortable, the area clean and small architectural designs are used to beautify life. Against this background of clear achievements by progressive organizations, the lack of effective concern for the living conditions of line workers shown by the managers of some trusts, such as Uralneftegazstroy, Tyumengazpromstroy and others, is all the more inexcusable.

In 1983 the Statute on field camps was approved. It comprehensively examines problems in their design, construction and operation. It sets social-living standards. It is essential to present this document to trusts, administrations and to each public Soviet and commandant of a field camp. The stability of collectives and labor productivity at the site depend upon living conditions on the line route. Experience in the construction of the Urengoy - Center-I line is significant: collectives with model field camps had better production results.

The provision of housing is undoubtedly one of the most important tasks in social development. Minneftegazstroy is engaged in a broad program of housing and civil construction, especially in West Siberia, where it is entrusted with the construction of comfortable towns in the oil and gas regions of the North. In the past years of the five-year plan 5,400,000 m<sup>2</sup> of housing, childrens' institutions for 29,000, hospitals with a total of 2,000 beds and schools for 41,000 pupils have been built. The ministry's own residential construction has reached large scales: during the five-year plan it is intended to put 2,7 million m<sup>2</sup> into operation. Housing conditions for 54,000 people will be improved.

In recent years the targets for the introduction of housing have been fulfilled, but plan intensiveness is still uneven. Thus, with equivalent requirements (per 1,000 workers), the Siberian main administrations and associations Sibkomplektmontazh [Possibly: Siberian Comprehensive Installation], Glavtyumentruboprovodstroy [Construction of Pipelines in Tyumen Oblast MA] and Glavtyumennetfegazstroy [Construction of Petroleum and Gas Industry Enterprises in Tyumen Oblast MA] are arranged in the following ratios with respect to housing introduction: 5.7 : 2.6 : 1.

More than half of housing construction programs are in West Siberia. The sector consciously centered its program here, thereby accelerating this very important oil and gas region's social development. This decision had results -- in the past 10 years the availability of well built housing in Tyumen Oblast has grown 2.5 fold and is approaching the country's average. However, the development of new fields and cities makes it impossible to be content with what has been attained. More effective solutions are required. In particular, it is advisable to increase the share of dormitories for young people and homes for small families as a percentage of total construction volume. This is not a new task. At one time the ministry was an initiator in the construction of homes for small families in Tyumen Oblast, considerably easing the housing problem in this rapidly developing region. It is now advisable to shift the youth housing construction program even more towards the northern gas bearing regions.

A sizable share of resources for housing construction are allocated to the northern regions. Capital investment funds for organizations in the central belt are limited and do not completely meet collectives' needs. Organizations such as Glavukr neftegazstroy [Ukrainian Neftegazstroy] Soyuzgazpromstroy [Gas Industry Construction], Tatneftstroy [Tatar Petroleum Industry Construction] and Soyuzneftgazstroykonstruktsiya [Possibly: Petroleum and Gas Structural Installation] are not fulfilling housing construction plans. At the same time, resourceful managers and public organizations of trusts and main administrations already have the possibilities of intensifying their own housing construction, attracting clients' resources, providing for shared participation and creating residential construction cooperatives. There is positive experience in the sector. For example, in 1983 Glavtruboprovodstroy and Glavyuzhtruboprovodstroy [Southern T-stroy] overfulfilled the programs for their own housing construction by almost 2 fold.

In recent years there have been substantial improvements in the qualitative composition and skill level of the sector's work force.

More than 40 percent of the workers in basic operations are in the fifth or sixth skill-category, while for machinery operators installing large gas pipelines the figure is 95 percent and for welders, 62 percent. The sector is increasingly staffed with highly skilled cadre, often with unique qualifications. The system of cadre training created in the ministry deserves a lot of merit for this. In 1983 more than 33,000 people passed training and retraining courses, while more than 48,000 learned second professions. Thus, during the year, 1 out of 4 basic operations workers acquired new knowledge and skills. The sector's cadre training system makes possible a technical modernization program, gives workers the possibilities for personal growth and improvement and helps improve collectives' social structures.

However, this system is still insufficiently linked to secondary schools and is weak in attracting their graduates. Not enough is done to attract school pupils to the main professions in petroleum and gas industry construction. These oversights have become especially clear in the light of those achievements in cadre work involving the political significance placed upon the most important projects in fuel power engineering. It is well known that the ministry's organizations were not successful in satisfying the requests of everyone who wished to participate in the construction of the Urengoy - Pomary -Uzhgorod Gas Pipeline.

Thanks to concern by the party and government, the sector's cadre situation has qualitatively improved. It is the task of managers and cadre services at main administrations and trusts to expand upon the successes attained and more completely use the possibilities created by the state.

It is very important to strengthen the material base of secondary and professional education. The ministry annually allocates more than 2 million rubles of capital investments just for the construction of new and the expansion of existing training and course work combines. However, these resources are not being used systematically enough.

Glavyuzhtruboprovodstroy is showing an example of a flexible approach to training base development. Using the client's resources, this year it will introduce a training course combine with a complete campus for 250 students. However, some managers do not show the necessary concern for the extended reproduction of labor resources. Placing hopes upon centralized selection, they are not training cadre for their own organizations. It is taking an intolerably long time to build the main training and course work combine in Tyumen. Glavtyumenneftegazstroy has not yet defined the combine's specialties. Glavsibtruboprovodstroy, which does large amounts of welding during line construction, has not yet set up a base for the welders' school. As a result, the region's organizations are compelled to train the majority of welders and burners at centers in the European part of the country.

Further development in the training system will see the convergence of training and replacement functions. That is, the main share of replacements should be trained at training centers and then do service at petroleum and gas construction projects, at progressive trusts in the sector. The experience acquired in this has been positive. From a sector and national economic perspective it is very necessary to develop training centers in the regions which have excess labor resources (Central Asia, the Transcaucasus). This requires the intensification of professional and technical education. In the long term these regions could supply petroleum and gas projects with qualified workers.

Special attention should be given to the training of brigade leaders -- the primary management link in working collectives. In 1983 1,500 people were trained at brigade leader courses. It is apparently necessary to have this training in every main administration and association. However, some organizations do not place the necessary importance upon the training of brigade leaders

and reserves (Soyuzpodvodtruboprovodstroy [Underwater T-stry], Soyuzintergazstroy [Interrepublic Gas Enterprise Construction Association], Glavvostotruboprovstroy and Glavtruboprovodstroy).

Trade service and food service have a great role in meeting the social needs of the sector's builders. The necessity of working far from populated points, in poorly developed regions with insufficient infrastructure requires the expansion of trade service and food service enterprises for field operations, along the routes of main pipelines.

For this purpose, Minneftegazstroy has organized 4 administrations and 48 departments for workers' supply and set up about 1,500 stores, of which almost 600 are mobile. The sector's trade enterprises have a turnover of more than 500 million rubles. The trade turnover growth in West Siberia substantially exceeds the average indicator. During the current five-year plan there has been an increase in the sales of the most important foodstuffs and manufactured goods. Taking the increased number of collectives into account, 1.4 - 1.5 fold more goods were sold than in 1975. The material-technical base of the URS [Administration of Workers' Supply] continues to develop rapidly.

The task of supplying all line workers with high calorie hot food is being successfully solved. This is the minimum which all trusts and associations must guarantee to line workers. Back in 1975 the sector began work on the organization of dietetic food service, requirements for which are quite great among middle aged and older cadre. At present more than 2,500 individuals receive dietetic meals at temporary duty and field camps.

The main thing for URS's is to provide a high level of services in field camps and developing regions, to intensify public control over cafeterias and line stores and to utilize, for workers, all stocks of goods experiencing increased demand.

Main pipeline builders are serviced by special health stations of the RSFSR Ministry of Health's Sanitation Administration. The organization of medical service along the line routes is an achievement by petroleum and gas construction. Medical institutions have been given a mobility corresponding to that of the sector. There are almost 1,000 medical workers, 92 doctor and 468 feldsher [doctor's assistant] health stations have been organized. Practically all field camps have emergency aid. However, it is necessary to do even more: increase the percentage of doctors health stations and strengthen long term ties with territorial medical organizations. It is especially important to provide preventive health services to line workers at their permanent residences.

Study shows that the sector's levels of sanitation and preventive health services lag considerably behind norms. They still are not meeting the goals for worker health care set by the social development program. The ministry's organizations only have sanitary and preventive health capacity for 700 and capacity for 6,000 at rest bases. This is very insufficient. Trusts and main administrations are not displaying enough initiative in the development of rest bases. These are very essential to workers in regions with severe natural and climatic



conditions. The construction of health facilities using organization funds must be viewed as a very important task for collectives' social development. It should be kept in mind that workers' health is the main wealth of society, a basic productive resource and simultaneously the most vivid evidence of concern about workers and an effective means for making collectives more stable.

The state allocates sizable resources for petroleum and gas construction. It is our task to use them for people's benefit.

Outlays for social development are paid off several fold by growth in labor productivity and improvements in collectives' attitudes. Therefore, the long term orientation for social development programs of Minneftegazstroy collectives is a sector with highly skilled stable cadre, labor productivity exceeding the world level and working conditions giving the profession huge prestige among youth and the entire Soviet people.

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## PIPELINE CONSTRUCTION

### MAY DAY MARKED BY CONSTRUCTION ACHIEVEMENTS

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 84 p 1

[Editorial: "Under the Banner of Peace and Endeavor"]

[Text] "Peace, Labor, May!" These words are printed on May Day banners. The May Day Holiday is always a symbol of the indestructible bond between the ideals of peace and socialism and the celebration of the principle of proletarian internationalism. Broad peace initiatives are coming from the Soviet Union and other countries of the socialist commonwealth. Together with all the Soviet people, fervently approving the consistent struggle of the CPSU and the Soviet state to avert the threat of nuclear war, builders of petroleum and gas industry enterprises are achieving new production successes to make a worthy contribution to further develop the country's economy and strengthen the might of the socialist homeland.

Striving through specific deeds to respond to the decisions of the February (1984) and April (1983) CPSU Central Committee Plena, the sector's workers have actively supported the valuable patriotic initiatives of progressive collectives.

There is a broad movement for the ahead of schedule completion of the Urengoy - Center-I Gas Pipeline, a project of major national economic significance. Competiting under the slogan: "Every Working Day -- 1 Kilometer of Finished Pipeline", stable work paces have been attained by the spreads under the leadership of V. Ya. Belyayeva, I. G. Shaykhutdinov, V. V. Mal'tsev, A. M. Blinov, A. K. Buyankin and others. Units of Glavtruboprovodstroy [Pipeline Construction Main Administration [MA]], Glavsibtruboprovodstroy [Construction of Pipelines in Siberia MA] and Glavvostoktruboprovodstroy [Pipeline Construction in the Eastern Regions MA] are directing their efforts towards laying long stretches of the Urengoy - Center II line by the end of 1984. Glavyuzhtruboprovodstroy [Pipeline Construction in the Southern Regions MA] units are doing everything necessary to beat the schedule for handing the Yelets - Kursk - Dikan'ka line over to the client. Ukrtruboprovodstroy [Ukrainian Truboprovodstroy] collectives are competing to complete the main line work on a 278 km stretch of the Kholmogory - Klin Petroleum Pipeline ahead of schedule.

Specialized administrations of the Vostokpodvodtruboprovodstroy [Eastern - Underwater T-stroy] Trust are keeping up pace setting rates on a number of

underwater crossings on the Urengoy - Center-II line. A progressive collective in this trust, the comprehensive brigade led by USSR State Prize Winner A. I. Shcherbakov, competing under the slogan: "The Brigade's Five-Year Target with a Smaller Crew", has obligated itself to attain a 10.7 percent above-plan increase in labor productivity.

Better results in the installation of production facilities are being attained by the brigades led by K. M. Zangiyev, V. I. Brizkun and R. S. Ibatullin. The collectives led by S. P. Strotsev and I. V. Smirnov have distinguished themselves in the construction of housing and social-cultural facilities.

High indicators are being attained by the collectives at: the Soyuzneftegazstroykonstruktsiy [Possibly: Petroleum and Gas Structural Installation] Association of the Gazmontazhavtomatika [possibly: Gas Automation Installation] Trust, the Bryansk Diesel Machinery Repair Plant and the Lvov Mechanical Plant. They have become the initiators of competition in the sector for a 1 percent above plan increase in labor productivity and an additional 0.5 percent reduction in prime costs. The Remmekhgazprom [Expansion unknown] Trust has spread the movement: "One Percent More -- One Day Earlier". The collective at SNMU Glavneftegazelektrospetstroy [possibly: Petroleum and Gas Electrical and Special Installation MA] has received the evaluations "Excellent" and "Good" for all its installation and adjustment work on important projects. Its slogan is: "From the High Quality Work of Each Worker -- to the High Efficiency of the Collective's Labor". Workers at the motor transport office of Lengazspetstroy [possibly: Leningrad Special Gas Construction] Trust have expanded competition between truck drivers based upon special economizing accounts.

The sector's collectives actively participated in the Communist Saturday dedicated to the 114th Anniversary of Lenin's birth. Units of Glavtruboprovodstroy and Glavvostoktruboprovodstroy completed significant amounts of work on the Urengoy - Center-I and II lines Saturday. A number of sections welded "Red Welds" and tested lines. Thousands of workers at Glavzapsibzhilstroy [West Siberian Housing Construction MA] worked on housing construction. Enterprises at the Soyuzremonttruboprovodtekhnik [Possibly: Pipeline Equipment Repair MA] produced sizable sums of industrial products. The resources earned by collectives and ministries on the Communist Saturday were transferred to the five-year plan fund.

These initiatives, the widespread socialist competition and highly productive labor are a contribution to the successful completion of the targets for 1984 and the five-year plan as a whole.

Success in the petroleum and gas construction program's implementation is also to a considerable degree determined by social factors. A thematic selection of articles in this issue is dedicated to the solution of social problems in the sector.

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## PIPELINE CONSTRUCTION

### WINTER GAS PIPELINE LAYING REPORTED

Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 84 p 10

[Article by G. Veselkov: "On the Gas Pipeline Routes in January"]

[Text] The builders of the main gas lines made a successful start in the 4th year of the 11th Five-Year Plan. Without lowering the pipeline laying rates they had reached at the end of 1983, they are persistently striving for the realization of new and critical assignments.

This year they have to complete the construction of the linear part of the fifth Urengoy--Tsent-I main gas pipeline built since the beginning of the five-year plan and start construction on a following sixth pipeline: Urengoy--Tsent-II. The introduction into operation of all the compressor stations on the Urengoy-Uzhgorod gas pipeline is insured.

In January the main efforts of the collectives of Glavsibtruboprovodstroy [Main Administration for Construction of Pipelines in Siberia], Glavvostoktruboprovodstroy [Main Administration for Pipeline Construction in the Eastern Regions] and Glavtruboprovodstroy [Administration of Gas Pipelines Under Construction] were concentrated on the most difficult Siberian leg. In the final section, Glavtruboprovodstroy's main work is already completed. In January, 22 production units insulated and laid in the trench 473 km of gas pipeline, for a total since the beginning of construction of 2,427 of the route's entire length of 3,020 km.

The rates that have now been achieved will make it possible to finish the linear work on the Urengoy--Tsent-I main gas pipeline ahead of schedule, in March, and to turn it over for operational use in the first half of the year, instead of in October, as specified in the plan.

The solution to this problem is being facilitated by a well-organized socialist competition at the construction sites. The best results in January were achieved by the collectives of the production units headed by M. Blinov (the Severtruboprovodstroy [probably Administration for Pipeline Construction in the Northern Regions] trust), F. Sosnin and V. Maslakov (the Novosibirsktruboprovodstroy [probably Administration for Pipeline Construction in Novosibirsk] trust) and N. Antonov (Bryansktruboprovodstroy [probably Administration for Pipeline Construction in Bryansk], who surpassed the goals set for them. A number of production units, including those led by route foremen V. Belyayevoy, L. Mikhel'son and A. Buyankin--who are well known throughout this

entire country--have already finished construction of the gas pipeline sections assigned to them and are working successfully on the Urengoy--Tsentr-II gas pipeline. From February to April, the rate of work on this gas pipeline will increase significantly because of the freeing of resources from the Urengoy--Tsentr-I route.

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## PIPELINE CONSTRUCTION

### CONSTRUCTION OF GAS PIPELINE TO WESTERN EUROPE DISCUSSED

Moscow STROITEL'NAYA GAZETA in Russian 3 Mar 84 p 4

[Article by G. Ovcharenko, with commentary by G. Chesnokov, chief dispatcher, Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises: "A Route of Records"]

[Text] The year 1983: the transcontinental Urengoy-Pomary-Uzhgorod gas pipeline is turned over for operational use considerably before the planned date.

On one of the main sections of this main gas pipeline, in Tyumen, the route had to pass under the many lines of the Medvezh'ye-Ural-Tsentr gas pipeline. But how was it to be laid if it was forbidden to turn the active lines off? Change the course of the new route? A long and expensive process. It was decided to build a tunnel, taking all the necessary precautionary measures.

In and of itself, this is a complicated and risky business. However, the most difficult part once the underground crossover was ready fell to Boris Diduk's crew. The welders were actually faced with having to weld individual pieces of pipe instead of the traditional sections. Any inaccuracy or lack of caution could cause a catastrophe.

However, the calculations were accurate, the crew had confidence in its own skills and, finally, there was that responsibility called citizenship. The unique operation performed by B. Diduk's crew was completed ahead of schedule.

This is only one little-known episode from the biography of this route. And how many of them were there that required bravery and precise engineering calculations, creative initiative and selflessness?!

Yes, the Western Siberia-Western Europe gas pipeline is a route of records. However, these records did not come about accidentally. They are a continuation and a regular consequence of the great and purposeful work being done by the branch's toilers to improve the effectiveness of their labor. This work continues today.

#### Commentary

The Urengoy-Pomary-Uzhgorod gas pipeline was a serious test for the branch. In the first place, it had to be built in an unprecedentedly short period of time.

Secondly, at Reagan's urging a number of Western companies did not deliver the promised materiel and equipment. Thirdly, the climatic and geological conditions were not on our side. Nevertheless, the subunits of Minneftegazstroy passed the test with honors. We laid this 4,451-km long transcontinental export pipeline in about a year, causing amazement and admiration throughout the entire world.

The basis of this success was the creation of integrated production units working under a single order and aimed at the final result, careful engineering preparation for the work, a high machinery replaceability factor, and an effective working "relay race."

We are now repeating and enlarging on the experience gained during the work on the main export line. Here is where it is showing up: new main gas and oil pipelines, new compressor stations, the outfitting of new fields, new settlements in Western Siberia, new branches from the central gas pipelines to enterprises--all of this is Minneftegazstroy's business. I will not misuse the figures, but I will cite one: this year alone, we are faced with laying about 16,000 km of pipeline, which is triple the length of the export gas pipeline. And I wish to add that the work on the routes is ahead of schedule.

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## PIPELINE CONSTRUCTION

### BOOK ABOUT URENGOY-UZHGOROD GAS PIPELINE DISCUSSED

Kiev PRAVDA UKRAINY in Russian 3 Mar 84 p 4

[Article by A. Povnitsa: "Reporting From the Route"]

[Text] This planet has never before known such a main gas pipeline. Pipe diameter--1,420 mm; length--4,451 km. It was necessary to conquer the tundra and taiga thickets, step over mountains, and force 800 water barriers from the northern subpolar area to the Carpathian uplands.

This planet has now known such speed of construction before, either. The builders moved 130 million m<sup>3</sup> of soil and welded and laid in trenches 2.7 million t of steel pipe. This colossal project was completed in just about 1 year, or three times as rapidly as normal.

Enemies tried to disrupt the project's completion date. Sanctions, embargoes, prohibitions. The outcome of these vain attempts is well known.

Last year, the CPSU Central Committee and the USSR Council of Ministers had warm congratulations for the participants in the construction of the Urengoy-Pomary-Uzhgorod main gas pipeline for their outstanding achievement, which was putting the pipeline into operation at its rated capacity.

How was this feat accomplished? Read the book "Annals of a Great Construction Project," a collection of works published recently by the "Izvestiya" Publishing House. It is the story of how people laid the main line and how the line formed the people.

The story is told by ministries and workers, party leaders and scientists, writers and journalists. They tell about the patriotic enthusiasm of the labor collectives, about innovators and front-rank workers on the route, about the creative achievements of scientists and designers, about the great organizational and political education work done by party, Soviet, trade union and Komsomol organizations. From the mosaic of interviews and essays, drawings and photographs included in the collection, an impressive picture of the "construction project of the century" and a clear image of the Soviet working man is formed.

In the materials in the collection there is a detailed discussion of the significant contribution made to the construction of the gas pipeline by the



Soviet Ukraine as a component part of this country's national economic complex. "According to the Law of Acceleration," was the title given to an account of an interview with Second Secretary A.A. Titarenko of the CC CP of the Ukraine by well-known journalists. The work on the 1,000-km Ukrainian section of the route, which passes through the territory of 10 oblasts was, indeed, done according to the law of acceleration. Enterprises and organizations in the republic took an active part in planning and building the main pipeline and in the production of the equipment needed for it. Staffs were created, on the initiative of party agencies, for the organization of an effective socialist competition and for monitoring the course of the work in the oblasts and rayons. "The workers of the Soviet Ukraine," said A.A. Titarenko at the conclusion of his interview, "did everything they could to see that this most important construction project was completed with honor."

The first Soviet long-distance gas pipeline (Saratov-Moscow) was laid during the years of the Great Patriotic War. After the war, the country obtained gas from Dashava and Shebelinka. Rivers of gas then began to flow from Uzbekistan, Turkmenia and the North Caucasus. Right now, powerful flows from the unique gas fields of Western Siberia and the Orenburg area are flowing into the channel that is the USSR Unified Gas Supply System, which encompasses all 15 union republics. The USSR's share of worldwide gas extraction already exceeds 30 percent, and in the next few years our country will occupy first place in this field.

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## PIPELINE CONSTRUCTION

### VESEL'YEV DISCUSSES WAGES, BONUSES FOR PIPELINE CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Apr 84 p 2

[Article by A. Vesel'yev, deputy minister, USSR Ministry of Construction of Petroleum and Gas Industry Enterprises: "The Goal and the Stimuli"]

[Text] Everyone who is participating in the construction of the main pipelines for the transportation of gas and oil is undoubtedly happy at the high rating given this work by Comrade K.U. Chernenko, CPSU Central Committee general secretary, when he meets voters. Actually, such scales and rates of construction have never before been seen in world practice: 40,000 km of large-diameter main lines have been built in only 4 years.

However, the more significant the result, the deeper the feeling of responsibility for one's own work and the greater the effort to penetrate deeper into its mechanism and find new reserves to speed it up. This active position is manifested clearly in the fact that Minneftegazstroy's [Ministry of Construction of Petroleum and Gas Industry Enterprises] specialists and labor collectives are looking for ways to improve the branch's economic mechanism so as to raise the productivity and quality of labor even higher.

In connection with this, life has placed before us many questions, and they are complex ones that cannot be solved at one stroke. The main one is: how to make wages a more effective means of affecting the final result? Practice has convinced us that the solution of the type "pay more and receive more and more quickly," which is the traditional one for any leader, produces negative results in the end. Despite the seeming validity of the existing systems of wages and bonuses, they are only slightly effective for aiming labor collectives at the creative search and the battle for constant improvement of economic indicators and reduction of nonproductive expenditures and losses. Different indicators on the basis of which a decision about the payment of bonuses is based, different sources for financing such payments, and different-sized bonuses for the workers and line engineering and technical personnel who are faced with common problems do not insure a common interest in their solution.

In carrying out its critical assignments for the construction of large gas transport systems, our ministry is conducting a constant search for practical ways of improving the effectiveness of material stimulation of workers. Since the beginning of this five-year plan, we in this branch have been realizing, in

stages, an integrated approach to the solution of this important national economic problem. The essence of the work is the creation of new organizational structures within the framework of stage-by-stage specialization and the formation, on this basis, of economically accountable low-level collectives with worker wages and bonuses being paid for the final result according to a single order. In line construction this means a pipeline section that has been turned over for testing, whereas in ground construction it means a unit, stage, or object. Under the specific conditions for laying main gas lines it proved to be advisable to create large low-level collectives: production lines, sections and columns numbering 100-250 people; that is, subunits capable of producing the final construction output by their own efforts.

In order to do this we have developed a special purpose scientific and technical production program that provides for the creation and introduction of a complex of machines and technology and the organization of high-speed, flow-line construction of large-diameter pipelines. In accordance with it, the structure of the trusts has also basically been reorganized. Their leading production subunits have become economically accountable, integrated, industrial production units. The experience accumulated in the branch was used as the basis for the methodical, standardized development of an experimental system for the organization of the work of these production units according to contractual autonomous financing agreements. The wages and bonuses of all those participating in the flow line of workers--from the worker to the leader--are paid according to a single order.

The preliminary results confirm the correctness of the path that has been chosen. Average monthly output rose by a factor of 1.5 in the economically accountable collectives, and the pipeline construction rate doubled. In the course of the experiment, these collectives have already laid--considerably ahead of schedule--about 900 km of main gas lines. Yet another fact of no little importance: for those who are working according to the principle of economic accountability, wage expenditures per kilometer of laid pipeline have dropped by 30 percent. At the same time, the earnings of each builder increased, on the average, by the same amount.

This is the effect that is achieved when each worker has a direct interest in the success of the entire collective. The single economic accountability agreement on the matter at hand united--both morally and materially--all categories of workers into a production unit and aimed them at the final result: the production of a certain section of main line with the lowest expenditures of labor and material resources.

With this form of production relationships, it proved possible to make the fullest use of the fundamental advantages inherent in the crew contract method, realize in practice the regulations of the Law on Labor Collectives, and conclude an agreement with a basic economic document that regulates the activities of the construction subunit. Actually, the assignment size and date of completion and the amounts of the wage and bonus payment funds (as computed by branch norms) are stipulated in the agreement. In connection with this, the collective receives the right to reduce the number of workers to the optimum number, encourage a creative search for the most rational production decisions, and

evaluate the contribution of each worker, using the coefficient of labor participation when calculating wages.

It goes without saying that it would be incorrect to talk only about the positive aspects of the experiment and keep silent about the difficulties and unanswered questions and the new problems that inevitably arise, since the search is moving along previously untrodden paths and is frequently in conflict with the established economic control system. For example, with maximum clarity the experiment confirmed the validity and necessity of a decisive improvement in the quality of long-term planning, stability in five-year plans, provision in them of the balanced use of resources, and mutual correlation of assignment sizes and completion dates in all branches of capital construction. This, unfortunately, we have not yet succeeded in achieving. Actually, though, this is an indispensable condition for the further improvement of construction production about which we sometimes "forget," assuming (mistakenly) that the source of all our problems is the poorly orchestrated introduction of the crew form of organization of labor and inadequacies in the different indicators for evaluating the activities of collectives.

A few words about another important conclusion. In addition to the technical, economic and organizational problems for which solutions must still be found, the experiment revealed a whole chain of problems of a social and (primarily) psychological nature that have been caused by certain contradictions between the fundamental essence of the new mechanism and the established stereotype of economic thought. The collectives have now been granted a considerable number of rights that, in essence, have limited the trust leaders' capability to "maneuver" people and materiel. Not long ago, a man who is respected in the branch and is in charge of a trust said, indignantly and perplexedly, "Well, how can I control these production units when they are subordinate not to me, but to points in an agreement? Now the production unit chiefs will be ordering me around: give them this, make sure that is done..."

It goes without saying that it is difficult to break old habits. Under the present conditions, however, the very concepts of "lead" and "control" have taken on a new and deeper meaning. Today, "to lead" does not mean simply to give orders. Today, this means primarily the ability to place in front of the collectives and entrust to them the realization of long-term and, at the same time, specific assignments and to subordinate one's own organizing work to the unconditional fulfillment of those obligations that the administration takes upon itself according the conditions of the agreement.

The economic experiment that Minneftegazstroy is now conducting is not unique in capital construction as a whole. Each construction ministry has formulated its own concept of subordinate economic accountability, of the final product and--it goes without saying--of bonus payments. We, for example, know that in USSR Minpromstroy [probably Ministry of the Construction Materials Industry] there is an integrated program named "Contract," and that the Union Minstroy [Ministry of Construction] and Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] are doing persistent work in this field. However, this activity has been interrupted not only bureaucratically, but also methodically. Would it not be better in this matter to join forces and, having selected what

is most valuable from the experience amassed by the individual ministries and departments, conduct an integrated experiment on the scale of the entire construction branch? It is really no secret that the exploratory activities now being carried out are far from always being realized on the necessary technical, scientific and methodological levels, so it sometimes has negative consequences, particularly as concerns questions of economic incentives. This leads not only to the irrational expenditure of state assets, but also traumatizes the labor collectives psychologically and destroys the workers' customary ideas about wages.

The interconnectedness of goal and stimuli is an indispensable condition and the essence of this work. The workers' creative initiative finds its expression in it. Its results are of considerable statewide importance. This is why it is advisable to enlarge the frameworks of local experiments and conduct a single, integrated one under the aegis of the Union Gosstroy, Goskomtrud [State Committee for Labor and Wages] and Stroybank [All-Union Bank for the Financing of Capital Investments]; that is, agencies that have sufficient authority to do it and that have at their disposal a network of competent scientific institutions. One would think that this will create all the prerequisites for this country's builders to enter the 12th Five-Year Plan with an economically and socially substantiated system for the organization of labor and material incentives.

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## PIPELINE CONSTRUCTION

### BRIEFS

URENGOY GAS TO NOVOCHEBOKSARSK--Cheboksary, 24 Mar--A plan has been developed for the construction of a gas pipeline that will connect the ultralong Urengoy-Uzhgorod main line to the town of Novocheboksarsk, which is just west of the Volga River. Siberian fuel will flow through this line to Novocheboksarsk's TETs-3, which is being converted from fuel oil to gas, as early as the second half of this year. [By PRAVDA stringer Yu. Knyazev] [Text] [Moscow PRAVDA in Russian 25 Mar 84 p 1] 11746

URENGOY--TSENTR-2 PIPELINE BEGUN--Krasnoslobodsk (Mordovian ASSR)--The builders of ultralong main gas transport lines have begun laying a new route through this autonomous republic. The first few hundred meters of the Urengoy--Tsent-2 pipeline were laid yesterday, ahead of schedule. The place where the large-diameter pipes were laid in the trench was the line section being worked on by Hero of Socialist Labor V. Belyayeva's crew. This collective is a constant leader in the socialist competition for the acceleration of gas pipeline construction rates. Working under a unified order, these pipeline workers were considerably ahead of schedule in turning over for operational use their segment of the Urengoy-Pomary-Uzhgorod main line and their section of the Urengoy--Tsent-1 fuel artery. They vowed to lay the new line even faster. This goal was formulated during a discussion of the results of the February (1984) Plenum of the CPSU Central Committee and the speeches of Comrade K.U. Chernenko. Using only fuel, energy and material resources that the collective has saved, it will be able to do its work on 21 April, a Leninist Communist Saturday. The calculations are rigorously substantiated. During the winter the builders took a large part of the pipe lengths out to the line stakes and repaired and placed in the starting positions all the necessary equipment. Sag pipes were laid along the bottoms of rivers ahead of time and the access roads were improved. Pipe is going to be laid in the most difficult sections of the route--through swamps, ravines, flood plains and swampy forests--before the roads turn to slush during the spring thaw. In order to speed up the work, additional line groups have been dislocated in a number of places. The "Styk" [joint] automatic unit, which connects pipe lengths without the usual electrodes, is having a good effect on the welding of pipe. Neighboring detachments have also been included in the construction of the new route. More than half the pipe has already been delivered to the area where it will be laid. The builders have vowed to lay and test the Mordovian section of the main line, which is about 220 km long, in the shortest possible period of time, and to complete it by the 67th anniversary of the Great October Revolution. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 14 Mar 84 p 1] 11746

URENGOY-TSENTR PIPELINE SECTION COMPLETED--Tyumen , 15 Mar--The laying of the first leg of the powerful Urengoy-Tsentr gas artery has been completed, in its most northerly section, considerably ahead of schedule. Testing will begin there soon, but work on the route has not abated. Subunits of Glavtyumen'truboprovodstroy [Main Administration for Pipeline Construction in the Tyumen' Region] are laying the second leg of the underground main line to the center of the country at a high rate of speed. The collective of Production Unit No 6, led by M. Blinov, is setting an example for the rest of the labor force. These line workers are close to being the first in the branch to complete two legs of the pipeline in their section during a single winter season. [By PRAVDA correspondent V. Lisin] [Text] [Moscow PRAVDA in Russian 16 Mar 84 p 1] 11746

URENGOY--TSENTR-1 GAS PIPELINE STRUCTURES--Cheboksary, 16 Mar--The rumble of construction machinery again filled the air in the area of the "Zavolzhskaya" gas compressor station. Its first stage, which is intended to serve the Urengoy-Uzhgorod main line, is already among the ranks of those in operation. The goal this year is to release for operational use a complex of structures for the Urengoy--Tsentr-1 gas pipeline. "Once again we will arm ourselves with the crew contract method, which has made a good showing, along with combination of professions and the consolidate method of installing elements of different units," says Communist Party Member I. Arkhipov, an assembly crew chief. "Our goal is to utilize the smallest forces to do the greatest possible amount of work in the shortest period of time while maintaining excellent quality." [By PRAVDA stringer Yu. Knyazev] [Text] [Moscow PRAVDA in Russian 17 Mar 84 p 1] 11746

MORDOVIAN PIPELINE SECTION COMPLETED--Krasnoslobodsk--The construction of the Mordovian section of the Urengoy--Tsentr-1 gas pipeline has been completed. The last length of pipe was laid in the trench yesterday, more than 3 months ahead of schedule. The builders completed this section of the pipeline, which is about 220 km long, one-fourth of a year quicker than during the construction of the Urengoy-Pomary-Uzhgorod leg. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 28 Mar 84 p 1] 11746

OIL PIPELINE TO ZUY--Irkutsk (TASS)--Because a large loading station has gone into operation at Zuy, on the East Siberian road, the effective use of rolling stock has become possible. Since ancient times this village near Irkutsk has been known only for the fact that coachmen changed horses there, on the long road from the Neva River to Lake Baykal. Now it is the terminus of the main oil pipeline from Western Siberia. A liquid freight complex that will be called upon to supply Tyumen' oil to the enterprises of the Far East has been built in this previously empty area. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Mar 84 p 2] 11746

GAS LINE IN TASHKENT--Tashkent--A new gas line has been laid in Tashkent at a record rate: it took a total of 6 days. It will provide an increased flow of almost 1 million m<sup>3</sup> of gas per day. The construction of this 8-km line was dictated by the severe winter that has just passed, when there was not enough gas for both industrial enterprises and residential microrayons because of the unforeseen freezes. The line intersects the Bozsu and Salar Canals, the Tashkent-Chirchik railway line, the ring highway and several streams. Without disrupting the transportation system's flow, the collectives of the

Sredazneftegazstroy, Uzbekgazifikatsiya, Uzbekgazstroy and Tashsantekhhgazmontazh trusts took care of this matter with the assistance of machine operators. Their shock labor and mutual assistance led to a record result. [By Sh. Zaynutdinov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 21 Mar 84 p 2] 11746

RING PIPELINE AROUND MOSCOW--Moscow--Quickly and with high-quality work, Moscow builders completed the construction of a new section of gas pipeline that will encircle the capital. A 40-km section of the pipeline has already been tested. The ring gas pipeline will be connected to many steel fuel arteries that are already in operation. This will make it possible to give additional energy, raw materials and fuel to Moscow and the oblast. Subunits of Mosgazprovodstroy [Moscow Trust for Gas Pipeline Construction], together with workers from the capital's welding and fitting trust, worked on the pipeline according to an accelerated schedule. Among those drawing nearer to the commissioning of the entire gas pipeline system is the integrated crew led by USSR State Prize Laureate V. Saratov. This collective was the first to use the flow-line method of welding. After completing its section, the crew went on to a new job: the Urengoy--Tsentr-2 pipeline. Mosgazprovodstroy's collective has been named the victor in the All-Union Socialist Competition for 1983. It will be awarded the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the VLKSM [All-Union Lenin Young Communist League] Central Committee and have its name entered on the All-Union Board of Honor at the USSR VDNKh [Exhibition of Achievements of the National Economy]. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 19 Feb 84 p 1] 11746

BACK-UP OIL PIPELINE TESTED--In the Sverdlovsk section of the main Kholmogory-Klin oil pipeline, testing has begun on a 60-km section of back-up pipeline that reaches from the Tavda River to the "Krutoye" oil-pumping station. The builders of the Tatnefteprovodstroy trust's Perm' SUMR-9 [expansion unknown] are doing the work there on an accelerated schedule. The crews of N. Kurbangaliyev, F. Fast, N. Osmankin and O. Medvedev finished their quarterly assignments ahead of schedule. Now they are getting ready to build a 140-km branch from the main gas pipelines to the Perm' GRES and the Urengoy--Tsentr-2 main gas line. [By V. Pankratov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 8 Apr 84 p 1] 11746

VOLGA-VYATKA PIPELINE SECTION COMPLETED--Kazan --The construction of the 214-km section of the Urengoy--Tsentr-1 gas pipeline stretching from the Volga River to the Vyatka River has been completed ahead of schedule. The last length of pipe has been laid in the trench. Two production units were engaged in the laying of this section. Their collectives finished the work in the most difficult sections as long ago as last summer. Before the beginning of the spring thaw, the builders crossed the flood plains of the Vyatka, Iletka and other rivers, as well as some swampy sections. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Feb 84 p 1] 11746

NEW PIPELINE-PACKING METHOD--A new ballasting method for main gas and oil pipelines, using a synthetic, nonfabric bed, has been recommended for widespread introduction. This decision was made by Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] and Mingazprom [Ministry



of the Gas Industry] after a study of an experiment conducted by Tyumen pipeline builders in the subpolar region. Right now, pipelines are secured beneath the ground with reinforced concrete prigruzzy [translation unknown] or metal anchors. Both methods are reliable, but are extremely labor-intensive and expensive. The proposal made by Glavsibtruboprovodstroy's [Main Administration for Construction of Pipelines in Siberia] innovators eliminates these shortcomings. Its essence is simple: a "blanket" made of the synthetic material is stuffed tightly around pipe, anchored to the edges of the trench, and covered with dirt. The new method promises an increase in the rate of construction and a significant savings in scarce metal and cement. Actually, 9 tons of the "non-fabric" can replace 2,000 tons of prigruzzy. [By A. Zhdanov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 28 Mar 84 p 3] 11746

VIATKA-VOLGA PIPELINE SECTION COMPLETED--The Tatnefteprovodstroy's collective finished the line work for the construction of the Vyatka-Volga section of the Urengoy--Tsentr-1 gas pipeline 3 months ahead of the date set in the plan. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 13, Mar 84 p 2] 11746

GAS PIPELINE RIVER CROSSING--Ismentsy (Mari ASSR)--The builders of the Mari section of the Urengoy--Tsentr-1 gas pipeline have begun to lay a sag pipe across the Ilet' River. V. Chernyavskiy's crew, from the Vostokpodvodtruboprovodstroy [probably Administration for Underwater Pipeline Construction in the Eastern Region] trust is familiar with this nonfreezing tributary of the Volga. When building the Urengoy-Pomary-Uzhgorod pipeline, they laid two sections of steel pipeline across it. The collective is using its experience successfully on its new construction project. In order to deal with the swampy flood plain and the forests, they waited for a hard winter freeze. The severe freezes helped them lay a temporary road to the river's bank, and the road was used to move materials, equipment and pipe and to prepare the trenches for the sag pipes, of which there are two--main and backup--in order to insure reliable operation of the gas pipeline. V. Chernyavskiy's crew vowed to lay the first of the 600-ton sag pipes in its underwater bed in a single day. The second crossing of the Ilet' is planned for March. This will make it possible to accelerate the release to the operators of an important section of this gas artery. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 17 Feb 84 p 1] 11746

URENGOY--TSENTR-2 PIPELINE IN MORDOVIA--Krasnoslobodsk (Mordovian ASSR)--The builders of the Urengoy--Tsentr-2 gas pipeline began laying pipe in this autonomous republic ahead of schedule. They vow that this section, which is about 220 km long, will be finished as soon as possible, by the 67th anniversary of the Great October Revolution. The most difficult sections--flood plains and ravines--will be finished before the spring thaw. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Mar 84 p 1] 11746

GAS-TRANSPORT TURBINE UNIT PLANT--Uzhgorod--In addition to the gigantic, recently finished Urengoy-Uzhgorod gas pipeline, through Trans-Carpathia there also pass two underground main lines for the transmission of natural fuel: "Bratstvo" [Brotherhood] and "Soyuz" [Union]. This, also, predetermined the further expansion of the experimental plant for the production of gas-transport turbine units that is located here. Next to its existing shops, a collective

of builders from fraternal Czechoslovakia has begun to build a central repair base for gas pipeline repair. By its size, the new project is essentially a large plant of its type. Under the roof covering the block of shops, there will be 52,000 m<sup>2</sup> of production space. [By V. Vukovich] [Text] [Moscow IZVESTIYA 30 Jan 84 p 2] 11746

KHOLMOGORY-KLIN PIPE LAYING FINISHED--Novosibirsk--Specialists from the Novosibirsktruboprovodstroy [expansion unknown] trust have gained a labor victory during their pre-May Day watch. The laying of the pipe for the Perm' 74-km section of the Kholmogory (Tyumen' Oblast)-Klin oil pipeline was completed ahead of schedule. Of great service in this matter were the crews of the Specialized Installation Administration No 2, which is led by Engineer V. Khuzhin. His accumulated experience was an important reserve. On an accelerated schedule, it was of assistance in the laying of the steel "thread" along the bottom of such capricious rivers as the Chusovaya and Lys'va. [By Yu. Yevsikov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 20 Apr 84 p 2] 11746

UDMURT PIPELINE SECTION FINISHED--Mozhga (Udmurt ASSR) (TASS)--The laying of the pipe for the Udmurt section of the Urengoy--Tsentr-1 gas pipeline has been completed. The final seam was welded here 3 months ahead of schedule. Preparations are being made for testing and release of the section. It should be turned over for operational use during the second quarter. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Mar 84 p 1] 11746

LINE COMPLETED -- Builders of the Urengoy - Center-1 line have successfully passed a new mark. They were 6 months ahead of schedule in completing pipe laying work on the entire 3,020 km of this pipeline from West Siberian gas fields to the city of Yelets in Lipetsk Oblast. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 17 Apr 84 p 2] 11574

SVERDLOVSK SECTION -- The collective of Yu. Listvin's spread from the Omsknefteprovodstroy [Omsk Petroleum Pipeline Construction Main Administration] Trust are ready to test a 28 km section of the Urengoy - Center-1 pipeline passing through northern Sverdlovsk Oblast. This is the last section of line built here by Omsk workers. The laying of the Urengoy - Center-2, the next transport artery, is simultaneously under way at full speed. [By E. Chernyshev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Apr 84 p 1] 11574

PELYM SECTION -- Pelym --The Collective of the Novosibirsktruboprovodstroy Trust has completed laying and begun testing a section of the Urengoy - Center-1 line running from Pelym to the 1,118 km marker. V. Maslakov's and F.Sosnin's spreads on this section have not only completed work here, but have begun testing the Urengoy - Center-2 line on the same route. [By P. Semenov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 15 Apr 84 p 1] 11574

**SHURTAN - MUBAREK LINE** -- The new Shurtan - Mubarek Main Gas Pipeline passes through drifting sands, irrigation canals and natural rivers. Units of the Bukharagazpromstroy Trust have begun accelerated work on this line. By the end of this year it is intended to complete this 102 km pipeline, one of the start-up projects of the Shurtan - Mubarek Industrial Complex in the northwest Karshinskaya Steppe. The fourth section of a gas processing plant and powerful processing installations for cleaning sulfurous gas are now being built, new gas fields are being constructed and exploratory drilling is under way. Cleaned of impurities, the gas is sent to various cities in Uzbekistan and neighboring republics, and the liquid sulfur goes for the manufacture of mineral fertilizers. [By Sh. Zaynutdinov] [Text] [Moscow STROITEL'NAYA GAZETA in Russian 6 May 84 p 3] 11574

**FLEXIBLE PIPE** -- Mingechnik -- The Mingechnik Industrial Rubber Items Plant has introduced a highly productive automatic, waste-free production line for manufacturing flexible, superstrong nonmetallic pipe. This innovation is the result of basic research conducted by scientists and engineers at the Institute of Mathematics and Mechanics of the Azerbaijan SSR Academy of Sciences. The pipe material is made out of fiberglass and rubber. Such synthetic pipe is easily wound onto a reel. An experimental batch of such pipe has already been tested at oil fields and in underground and major repair processes at wells. Its economic effect amounts to hundreds of thousands of rubles. This year it is planned to produce more than 30,000 meters of new pipe. It is impatiently expected by oil and other workers. More than 300 departments, enterprises and organizations plan to introduce it. [By D. Melikov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Apr 84 p 2] 11574

**PIPE LAYING** -- Krasnoslobodsk (Mordovian ASSR) -- Builders of the Urengoy - Center-2 line are ahead of schedule in starting pipe laying work in the autonomous republic. They have obligated themselves to prepare about 220 km of route in a very short time -- for the 67th Anniversary of the Great October Revolution. It is intended to pass through the most difficult areas (flood plains and ravines) prior to the spring thaws. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 May 84 p 1] 11574

**URENGOY - CENTER LINES** -- Construction work on two lines of the Urengoy - Center Pipeline is underway at an urgent pace. These lines' completion will considerably increase the delivery of natural gas to the country's industrial centers. Units in the Main Administration for the Construction of Pipelines in Siberia are completing line work on a stretch almost 1,000 km long. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 31 Mar 84 p 2] 11574

**UDMURT LINE WORK** -- Work has begun on a 200 km Udmurt section of the Urengoy - Center-2 line. The progressive welders brigades led by V. Krylov and L. Gogolev in the Ufa Trust of the Main Administration for Pipeline Construction in the Eastern Regions made the first welds on the new line near the city of Mozhga. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 18, Apr 84 p 2] 11574

MORDOVIAN SECTION --(Krasnoslobodsk (Mordovian ASSR)-- Builders of the extra long main gas pipeline began pipe laying work in the autonomous republic. The first few hundred meters of the Urengoy - Center-1 line were laid ahead of schedule. The section of Hero of Socialist Labor V. Belyayeva has arrived at the site where the large diameter line is dropped into the trench. The collective is a steady leader in socialist competition for accelerating the pace of pipeline construction. Working under a single job order, the line workers have been significantly ahead of schedule in putting into operation their section of the Urengoy - Pomary - Uzhgorod line and a section of the Urengoy - Center-1 line. It was resolved to lay the new line even faster. This goal was posed during a discussion of the results of the February (1984) CPSU Central Committee Plenum and the speech by comrade K. U. Chernenko. The collective will work on 21 April, a Leninist Saturday, completely with saved fuel-energy and material resources. The calculations have a firm basis. During the winter the builders hauled large amounts of pipe to the site, repaired and arranged all necessary equipment at its starting positions. Inverted siphons were installed on river bottoms and approach roads improved ahead of time. In order to speed up work additional line groups have been sent to a number of sites. "Styk" [Joint] automatic devices, joining pipe lengths without using ordinary electrodes, assure highly effective pipe welding. Neighboring detachments are also engaged on the new line. More than half of the pipe has already been delivered to the route. The builders have obligated themselves to quickly, by the 67th Anniversary of the October Revolution, lay and test the roughly 220 km Mordovian section of the Line. [By TASS] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Mar 84 p 1] 11574

READY FOR TESTS -- Moscow -- Yesterday builders of the Urengoy - Center-1 line passed a new mark. They were 6 months ahead of schedule in laying the entire 3,020 km of this line from West Siberian gas fields to the city of Yelets in Lipetsk Oblast. Last February the first kilometers of pipe were welded. Line workers made early preparations for beginning work: equipment was tested and the necessary stocks of pipe hauled to the site. The builders' main reserves are the precise work rhythm of the spreads, widespread socialist competition, the efficient use of equipment and excellent work by adjacent units. [By TASS] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Apr 84 p 1] 11574

TYUMEN SECTION COMPLETED -- Tyumen Oblast -- The last weld has been made on the Tyumen section of the Urengoy - Center-1 line. The large diameter pipes of the entire northern arm (more than 1,000 km) have been united into a single line and reliably sealed. A large part of the line has been lowered in the trench and covered. Everywhere preparations are under way to test it for tightness and strength. The work environment on the line and the attitudes of labor collectives leave no doubt that specialists at the Main Administration for the Construction of Pipelines in Siberia are performing their high obligations -- completely finishing all line work on this very important project by the 114th anniversary of the birth of V.I. Lenin. [By. Yu. Perepletkin] [Text] [Moscow IZVESTIYA in Russian 1 Apr 84 p 2] 11574

CSO: 1822/306

## RELATED EQUIPMENT

### NEW HEAT LINE INSULATION

Moscow VECHERNYAYA MOSKVA in Russian 9 Nov 83 p 1

[Article by V. Maksimov, "A Winter Coat for Heat Lines"]

[Text] Specialists in Moscow have developed a new inexpensive, economical insulation material for heat conduits.

Thousands of kilometers of heating arteries have been laid beneath the streets and courtyards of the capital. It is known that laying them is extremely laborious and expensive. The pipes are usually wrapped in slag cotton covered with metallic screen and asbestos plaster. They are then placed into a special trench made of ferroconcrete slabs. This insulation is fairly complicated, but regrettably not too dependable. It does not always protect the pipes from corrosion which, nine out of ten times is the cause of accidents.

Specialists of VNIPIenergoprom [All-Union State Scientific and Research Planning and Design Institute for Industrial Power and Efficient Use of Fuel in Industry, Electrical Heating and Secondary Power Resources] has suggested using frothed polymerconcrete to protect the pipes.

"It was difficult to develop a material combining strength, light weight, moisture resistance and low heat conductivity", says laboratory head A. Krasovitskiy. "Various specialists participated in the research, including chemists and thermal technicians."

Polymerconcrete manufacturing technology is fairly simple, and uses no scarce materials. The insulation can be made either in a plant or right at the worksite. No anticorrosion treatment is needed.

The Moscow process is protected by ten inventor certificates and has been awarded the VDNKh [Exhibition of Achievements of the National Economy] Medal. Experimental sections of the heat pipes insulated with polymerconcrete successfully passed the trials. Depending on pipe diameter, the economic effects of this new insulation amount to from 50,000 to 130,000 rubles per kilometer. Right now at the Moscow Pipe Procurement Plant additional facilities are being added to the shops where frothed polymerconcrete will be produced. The Muscovites' new heat conduit has been used in Leningrad, Lipetsk, Tashkent, Gorkiy and elsewhere.

For the time being polymerconcrete is being used only for distributive heat lines which have a diameter of up to 300 millimeters. But VNIPIenergoprom specialists are already working on a refinement of this novelty.

Today a series of experiments has begun, the goal of which is to create technology using polymerconcrete on heat conduits of up to one-and-a-half meter's diameter.

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CSO: 1822/303

## RELATED EQUIPMENT

### BRIEFS

URENGOY PIPELINE REACHES CZECHOSLOVAKIA--860 kilometers is the length of pipeline now operating in the Czechoslovakia sector of the Urengoy--Ushgorod --Western Europe transit pipeline. The new line is being constructed in strict compliance with the time-table. One hundred sixty kilometers of the pipeline have been laid and the necessary compressor stations are operating. Photo Caption (Photo not reproduced): Pipe laying work near the city of Rozvadov on the Czechoslovak-Federal Republic of Germany border. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 11 Feb 84 p 3] 12659

DON-ELETS PIPELINE--The initial kilometers of pipe have been laid in the ditch for the Urengoy--Tsentr-2 pipeline in the sector extending from the Don river to the city of Elelets. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 12, Mar 84 p 3] 12659

CSO: 1822/303

## GENERAL

### SIBERIAN CONSTRUCTION ASSOCIATION OUTLINES DEVELOPMENT PLAN

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 84 pp 13-14

[Article by V. A. Aronov, Sibkomplektmontazh Association: "A Social Program Is Realized"]

[Text] Three years ago the Sibkomplektmontazh Association developed a complex socio-economic development plan. There is a periodic summation of the projected part of this plan.

The Sibkomplektmontazh collective grows by 800-900 people annually. It is clear that the hiring, deployment, teaching of a profession, and consolidating such a mass of people is impossible without the painstaking purposeful labor of all the spheres of the association, of the leaders of subdivisions, of party, trade union and other public organizations.

Today the association possesses 267,000 square meters of living space. In the last year alone around 40,000 square meters of living space has been readied in Tyumen, Nadym, Novyy Urengoy, Nefteyugansk, and in the settlements Borovskiy, Solnechnyy, Komsomolskiy, and Noyabrskiy. And yet there is still a shortage of living space. By the end of the 5-year plan the union will strive to satisfy the workers' demands for living space.

The solution of problems of production and social and cultural amenities is aided by new forms of labor organization, particularly by the team contract. Last year 73 construction-assembly collectives, i.e., 59 percent of the total number of workers in the construction-assembly field worked under team contract. Of the total volume of the union's construction-assembly work, 64.7 percent was accomplished by the contract brigade method. Thanks to the institution of this method in 1983, virtually 82 people have been freed, which has generated a 1.2 percent increase in labor productivity.

The indicators of the integrated khozaschet brigade, headed by I. V. Smirnov, are high. Last year this brigade built a kindergarten for 320 children, turned over three buildings containing 205 apartments, and gained a head start on 1984. Construction-assembly work totaling 2.6 million rubles was completed, which is 551,000 rubles more than in the first year of the 5-year plan.



A large influence on the strengthening of the collective has been exerted by the application of KTU [coefficient of labor participation] to the distribution of wages and bonuses among the members of the team. Not a single instance of the violation of labor discipline, of low work quality, or of a careless attitude toward construction materials has gone unnoticed.

In our social plan, the rotating-duty expeditionary method of work is new. As is known it is not easy to build cities and settlements with an entire array of domestic and cultural institutions near remote northern installations. The permanent residence of our assemblers is in Tyumen; they are sent to work sites in the north on a 2-week shift. There are many such specialists, about 1,500. Unfortunately, the general contractor does not concern himself with the improvement of the social and domestic conditions of this category of worker at northern installations. Therefore we have been obliged more than once to divert the union's efforts toward providing the shift workers with absolute essentials; this has happened, for example, at the Krutoye and Sharan oil pipeline stations, the Pripolyarnaya compressor station, and others. Unfortunately, such practices still exist today. A restructuring is extremely necessary in this problem. Assembly of the installation should begin only when normal conditions for labor, food service, and recreation have been established for the people. Side by side with complete preparation of the unloading area, foundations, and assembly zones, we must secure from the general contractor the reliable operation of social services.

The day to day life of the worker--the association thinks of it constantly. During the 10th Five-Year Plan and 3 years of the current five-year plan 5 dining facilities for 925 persons and 5 snack bars, able to serve 475 persons, have been built. In solving the problems of public nutrition a considerable role has been played by an auxiliary farm organized 4 years ago. By the end of 1983 the cattle herd had grown to 680 head. The hog-breeding program is growing. At the present time more than 500 animals are being fattened on the farm.

A nucleus of the Montazhnik auxiliary farm collective was formed, and is directed by experienced specialists. It is growing and strengthening economically. The figures attest to this: in 1983 3,600 quintals of milk and 1,410 quintals of butter were produced; in 1984 these indices should reach 5,000 and 1,500 respectively. Journeyman machine milkers get 10 liters from each cow daily.

A team of fishermen put 110 tons of lake fish on the workers' tables last year.

The Sibkomplektmontazh Association is youthful. Almost half of it is comprised of people under the age of 30. A specific system for working with young people has been put together. The association's new arrivals are acquainted first of all with a professional-moral code in which, in addition to other pieces of advice is the following: "Know how to rest. Your free time is your wealth. Do not squander it."

A young person has someplace to spend his free hours with benefit to himself. The material base of cultural and educational institutions is constantly being improved. The Tyumen trade union club, whose special interest groups involve 150 people, has been in operation for over a year. In the seven Tyumen subdivisions amateur artistic activity is well developed. In the course of the last year amateur performers have given 60 concerts. The club has taken the right direction: it creatively cooperates with the library and with the houses and palaces of culture in the city. Today we are striving to activize the ideological maintenance of the workers at northern installations.

Sports activities are being developed. In the oblast center has a sports complex, the Patriot. Here there are a football field, a track, a shooting range, and basketball and volleyball courts at the workers' disposal. Five hundred people can work out simultaneously in these health facilities. In the children's sports school there are five standard gyms and three hockey rinks. All this allows winter and summer games to be held annually in 19 sports.

The good material base and high organizational level of Soviet physical culture has made it possible to attract 4,200 people to systematic participation in sports, that include USSR Masters of sport, candidates for the rank of master, and about 1,500 athletes with official ranking.

Special significance is attached to indoctrination work by place of residence. It should target the entire population of the microrayons: school children, workers, pensioners, and housewives. In the first microrayon, for example, where several thousand of the association's workers live, a children's club was opened and a meeting area and ski depot were outfitted. Mass events have become traditional here, such as the New Year's and May Day holidays and Spring carnival.

The housing committees, dormitory soviets, and the law and order support center organize [indoctrination] work according to place of residence. The microrayon community soviet coordinates and directs their efforts. So far there is no house of culture or movie theater here. Therefore, it has been decided to broaden the clubs' facilities. There are interesting examples of their efforts, for example, the SMiD (Boys' and Girls' Friendship) Society, where children of various ages eagerly attend. More than 400 kids are active in the club's nine special interest groups and five sports sections.

A comprehensive program has been developed in the union for indoctrination work in the young people's dormitories. A methodological Soviet is available.

Unfortunately, indoctrination work does not meet current needs everywhere. The party, trade union, and Komsomol organizations of several subdivisions poorly manage their work. They still lack a systematic method, planning, and purpose.

In speaking of indoctrination according to place of residence one must not forget the family; it is also a "place of residence", a psychological sanctuary, and a special place for rest and renewing strength for the production of social labor. The character of family relations has its own influence on the resolution of problems in the economic, cultural, and moral order and on

the indoctrination process. In this connection pedagogical readings, universal education of parents, and appearances by lecturers from the primary organization of the Znaniye Society are important.

The dormitories for youth and young families (there are 21 such dormitories in the Association) have study rooms, libraries, political reading rooms, and recreation rooms. In the summer period nearly every Sunday thematic meetings are organized with the microrayon residents and concerts are held. Also book fairs and exhibit-sales of culinary wares are held.

The problem of kindergartens has virtually been solved in the union; our resources in terms of pre-school facilities can serve 2,780 students. There are 675 childhood education specialists working here permanently.

Much has been done, but a no less complicated task is ahead of us: to expand the ideological work civil, ethical and psychological, medical, and legal education; in propaganda, and of the consolidation and development of the Soviet way of life.

It is necessary to strengthen the work of the Komsomol committees. Often it is limited only to provision of entertainment. The organization of recreational parties and special interest clubs is a necessary pursuit, but this is a small part of the work that must be carried out. Taking into consideration that in the youthful environment one encounters such phenomena as the delayed development of good citizenship, political naivete, parasitism, and manifestations of mercantilism, it is necessary to conduct more activities to facilitate the ideological-moral, class, and labor tempering of youth. Leadership training in school aids the development of good citizenship in Komsomol members, as does the CPTU (city professional-technical school) in adolescents. For the time being the Komsomol committees conduct this work timidly and unsystematically.

In working with youth, the veterans of labor and the party have rendered us invaluable aid. They have come through a hard school of struggle and accumulated a great deal of experience which must be utilized.

In order to carry out sociological research it is advisable that information and counseling services be set up so that having called, for example, 04 on the telephone, everyone would be able to express his opinion on social and personal questions. Remarks, requests, and suggestions will be forwarded for the consideration of the administration to the party committee and the union trade union.

In the current year we are faced with completing 177.8 million rubles worth of work; building 19 compressor stations and five complex gas preparation facilities, as well as completing construction of new gas condensing installations in Urengoy, Surgut, and at other sites. We must still transport two boiler blocks to Yamburg on an air cushion, manufacture an experimental block-pontoon with a load-carrying capacity of 1,000 tons and transport the equipment that must be mounted on it on an air cushion, and deliver it to Yamburg no later than August. This will make it possible to begin setting up equipment at the deposits using blocks of increased tonnage.

We have all the necessary capabilities to carry out these tasks as well as the resources and technology, and most important, have excellent workers' collectives and highly qualified engineering and technical workers.

The implementation of the achievements in technological progress, precise organization of work, strengthening labor and planning discipline, and putting into effect the plan for socio-economic development, will all make it possible to achieve a 1.2 percent increase over the projected 1984 plan for labor productivity and a 0.6 percent decrease in the cost of construction.

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## GENERAL

### NEED TO COMBAT AGAINST THEFT, WASTE OF GASOLINE DISCUSSED

Moscow SOTSIALISTICHESKAYA ZAKONNOST' in Russian No 3, Mar 84 pp 35-36

[Article by E. Vladimirov, deputy chief, General Inspection Administration of the USSR Office of the Public Procurators: "Intensifying the Struggle With Wasteful Practices Regarding Fuel and Power Resources"]

[Text] Gasoline and other fuels and lubricants that constitute the basis of the fuel and power balance of the country occupy a special place among the material resources of the national economy. Their waste causes significant harm to the national economy. This happens most of all in automotive transport organizations.

The CPSU Central Committee and the USSR Soviet of Ministers have approved Decree No 759 "On Increasing the Efficiency of Utilization of Automotive Transport Equipment in the National Economy, Intensifying the Struggle With Additions to Shipments of Cargoes by Automotive Transport and Assuring the Security of Fuel-Lubricant Materials." It calls for an increase in the responsibility of ministries and departments for observing discipline in transportation and intensifying their struggle with wasteful practices.

An ukase of the Presidium of the USSR Supreme Soviet dated 23 August 1983 has set the administrative penalty for the illegal release and receipt of gasoline and other fuels and lubricants in the form of a fine of 20-100 rubles in the absence of evidence of theft. In addition, in RSFSR and other union republics criminal penalties have been introduced for the illegal release of gasoline or other fuels and lubricants when these actions are performed by persons who have previously been subjected to administrative penalties.

The Office of the Public Procurator has intensified its supervision of the enforcement of the laws governing the utilization and storage of fuel and power resources. Procurators conduct inspections at enterprises and organizations, take measures to eliminate violations of the law, and bring guilty parties to justice. Leningrad's Office of the Public Procurator, for instance, has initiated supervision of the enforcement of the above laws. This office recently conducted inspections at automotive transport enterprises. At the request of the procurator, those found guilty of wasteful activities were punished. The CPSU obkom was informed of the results. To improve the supervisory capabilities of procurator offices, exercises have been conducted with representatives and

assistants of rayon procurator offices, with specific methodological directives offered for inspections of compliance with the laws governing responsibility for additions at automotive transport enterprises. Materials from these inspections are used on television programs.

However, despite the measures that have been implemented, violations of the law are still widespread. Certain ministries, departments, enterprises, and organizations have still not been able to eliminate the causes of theft and unproductive losses of coal, natural gas, petroleum and petroleum products, thermal and electrical energy. As before, instances of wastefulness are widespread at facilities of USSR Minugleprom [Ministry of the Coal Industry], Minudobreniye [Ministry of Mineral Fertilizer Production], Minlesbumprom [Ministry of Timber, Pulp and Paper, and Wood Processing Industry], Minchermet [Ministry of Ferrous Metallurgy], Minkhimprom [Ministry of the Chemical Industry], and Minstroyaterialov [Ministry of Construction Materials Industry]. Planning, judicial, contractual and other services are not being conducted in a principled manner.

Internal departmental control, the inspection of which is often conducted in a slipshod way, is not exerting the influence that it should. The Turkmen SSR procurator's office discovered just such a situation in the republic Goskomsel-khoztekhnika State Agricultural Equipment Association. Many instances of excessive fuel usage, and theft by illegal writeoffs were discovered. The chief engineer of the Bayram-Aliy rayon association wrote off 470,000 liters of gasoline for mercenary motives. He was charged with criminal responsibility and convicted. At the request of the procurator's office, measures have been taken to eliminate this type of violation of the above laws.

There is insufficient control over the activities of persons in positions of responsibility at agricultural organizations, who are responsible for the fact that more than half the oil storage facilities at kolkhozes and sovkhoses are not equipped with the necessary equipment for recording fuel transactions, and the equipment which does exist has fallen into disrepair, or is missing essential parts. The refueling of agricultural equipment is often approximated by eye using with buckets, and fuel tanks are left open. Some of the tanks, moreover are defective, leading to losses of fuels and lubricants, but the guilty parties, as a rule, go unpunished. As a result of the wasteful practices of the managers of the petroleum storage facility at the Zavet Il'icha kolkhoz of the Dinsk rayon of Krasnodar's Disterlo kray, which included the use of a defective gasoline pumping system, there was a leak of 69 tons of fuel. The guilty parties were convicted and measures were taken to compensate for the harm suffered by the state.

The struggle with legal violations at many automotive transport enterprises and organizations also leaves much to be desired. In many instances the appropriate control is not exercised over accounting for shipments, bills of lading are not properly filled out and the requisite attention is not paid to the efficient utilization of the truck fleet. Excessive vehicle idleness is not being curtailed, and measures are not being taken to outfit them with equipment that is in good repair and watertight.

A similar situation was discovered by the oblast procurator at the Orenburg Transportation Administration of RSFSR Minavtotrans [Ministry of Automotive Transport]. Additions to cargo shipments were discovered at every second enterprise by departmental inspections. As a result of this deception of the state, in a year clients were overcharged by more than 25,000 rubles, and many drivers received illegal wages. The many instances of operation of vehicles with improperly calibrated or nonfunctional speedometers is also conducive to misuse. For instance, an inspection at the Sorochin Passenger Automotive Transport Enterprise indicated that every third bus was operating with improperly running motors. In most instances, administrators do not take the requisite measures following such discoveries and the guilty parties go unpunished. The procurator's office has initiated several criminal proceedings, and has convicted 11 people of disciplinary and monetary responsibility for wasteful practices.

The USSR Public Procurator's Office has established that the above violations of the law are widespread in the automotive transport organizations of the Belorussian SSR Minplodoovoshchkhov [Ministry of the Fruit and Vegetable Industry]. The Ministry neither analyzed nor publicized materials concerning these violations. Nevertheless, over the past several years in the Volma association of this ministry the lack of appropriate controls has permitted a number of senior people, including the chief of the shipping department, Dydyshko, to loot fuel, lubricants and other property in the amount of more than 22,000 rubles. The guilty parties have been brought to justice.

The inadequacy of the struggle against violations of the law within the systems of this same ministry is shown by the results of an inspection conducted at its constituent Sovkhoz imeni Lenina. In this organization more than one-half of the vehicles were being operated with incorrect speedometers, the quality of inventory records concerning petroleum products was substandard, bills of lading were being filled out in violation of established regulations, and lubricants were being dispensed without meters, in buckets. The USSR Public Procurator's Office has raised the issue of whether to bring the guilty parties to justice and put a stop to these violations.

Certain departments responsible for inspections, including USSR Goskomnefteprodukt are not providing appropriate controls on the efficient use of fuel. In an environment where control was absent, a criminal group was active at the Salyansk refueling station and other organizations in the Azerbaijan SSR. In a little over two years, by increasing the density indicators of petroleum products in their accounting reports, they were able to loot more than 550,000 liters of gasoline and diesel fuel valued at 120,000 rubles. The guilty parties were convicted.

Employees of certain other inspection organs, among them Gosenergonadzor [not further identified] have not been overly active in curtailing violations of state discipline.

In the Moldavian SSR, for instance, at the Telenesht office of the Strashensk Interrayon Energy Inspectorate, the republic procurator's office found serious lapses in the enforcement of the legal requirements to combat wasteful practices. This office was late in reading documents on discovered violations,

failed to take the appropriate measures to compensate for damages caused by the theft of electric power, and frequently failed to bring to justice violators of state discipline. At the request of the attorney general the chief of the interrayon division, Gebos, was relieved of his position, and the chief engineer of the office, Kal'nev, was also brought to justice. Measures were taken to eliminate the legal violations.

There are shortcomings in the organization of the struggle with the above violations of the law and in the activities of the organs of internal affairs. In a number of locations there is still inadequate application of the legal provisions for administrative penalties for the illegal release of fuel. This type of situation has been discovered, for instance, in the Belorussian SSR.

There is a need for a serious improvement in the supervision by attorney general's offices of compliance with these laws. Inspection activities are still not assertive enough and the very organization of the supervision in many instances does not correspond to necessary requirements. At times, attorneys general offices carry out superficial inspections, which do not allow them to catch individuals engaging in violations. What it does allow them to compile is information which on many occasions leads them to individuals who have committed crimes. The necessary attention is not paid, however, to arranging compensation for the damages that are incurred (suits are rarely brought against guilty parties, and they do not require it of managers). Sufficient supervision is not provided over the timely pressing of criminal charges for embezzlement, additions, and the wasteful use of fuel and power; sometimes the suits that are brought are unjustified. Procurator offices have been neglecting to monitor the proceedings in cases of this type when they are before the courts. Some procurators underestimate the educative importance of publicity of legal proceedings, fail to pose questions regarding the conduct of special court proceedings on particularly topical issues, and do not do enough to attract the attention of the public to participate in these cases. Inspections have shown that in some republics broad publicity is not given to information concerning violations of the law, and that procurators rarely speak on issues of the struggle with wasteful practices in the use of fuel and power resources in the press and on the radio. The above kinds of shortcomings have been discovered in the activities of the procurators of the Minsk, Tyumen, Ulyanovsk and Smolensk oblasts and other regions.

To eliminate these shortcomings it makes sense to improve the organization of work, upgrade its style. Not limiting ourselves by preconceptions, it is essential to achieve the full elimination of these violations, remembering that the sending of documents with the procurator's opinion is only the beginning of work to root out theft, add-ons and wasteful practices.

An important principle of this work should be the unification of efforts of the law enforcement, and inspection organs, ministries and departments to curtail wasteful practices. Only if this is done will the measures that have been implemented be effective, in the sense required by resolutions of the party and government.

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GENERAL

## SOCIOLOGIST VIEWS INFRASTRUCTURE AT TYUMEN FIELDS

Moscow SOVETSKAYA ROSSIYA in Russian 1 Dec 83 p 1

[Article by Viktor Trushkov, doctor of philosophical sciences: "The Future Profile of an Oil Region: A Sociologist's Opinion"]

[Text] On the last day of September the Tyumen oil workers for the first time extracted over a 24-hour period 1 million tons of "black gold"--enough for a freight train stretching from Moscow to Yaroslavl. It is an event that will probably go down in the history of our national economy; as recently as 12 years ago we were happy if we received this much oil in one day from all the fields of the entire country.

Tyumen oil determines the energy potential of the country. It makes a substantial contribution to the economy and to our defense capability. Its quiet gurgling in oil pipelines is quite audible to friends as well as foes. And sometimes, this gurgling is second to none to the eloquence of diplomats.

Nevertheless, a case can be made for the fact that the greatest consequence of the increasing power of this Siberian petroleum river lies in the social sphere. Its mouth lies in a region with F. M. Dostoyevsky at one time used as the locale for "Notes From the House of the Dead." In 1913, statistics showed that "among the industrial provinces of the Russian empire, the Tobolsk Province occupies quite a modest place." Indeed, it would be hard to imagine a more modest place: each enterprise there had an average of five employees.

Soviet power changed the face of this region. But the gap in the development of the Tyumen Oblast and the industrial rayons in the European portion of the country remained noticeable. As recently as 25 years ago urban residents in this kray represented less than one-third of the population, a lower figure than in other krays and oblasts of Siberia and the Far East.

The discovery of oil and gas transformed the Tyumen land, the area of which is larger than Great Britain, France, Italy and Finland taken together. Ten new cities appeared. The development of the Western Siberian complex demonstrated that contemporary industrial production practices are consistent only with an urban type of settlement. The new Tyumen cities have been evolving not so much as a result of numerous construction projects but of numerous coincidences. As recently as 1974 several designers stated that "Nefteyugansk

has no future for industrial development and can become an agricultural and fishing center of the suburban type." As of today the city has grown two and one-half times and Yuganskneftegaz has become one of the leading enterprises in this sector.

Currently, a great effort is being made around subarctic cities--centers of the gas industry. Three times already they have looked at the general plan of Novyy Urengoy. In the process, estimates have climbed from 50,000 to 150,000 inhabitants. The Yambur field is being brought on stream as fast as possible and arguments are also raging: build a new city or use the watch-expedition technique? The oil workers are making new discoveries, even as they have the same problems and the same arguments. But it is hardly sensible to limit ourselves to the building of a settlement in a place where work collectives numbering in the tens of thousands are needed.

No, a million tons per day does not only mean an efficiently loaded freight train from Moscow to Yaroslavl. It is a unique viewing 'projector' that illuminates both our victories and our problems. Today, this represents a figure for which others should strive. The next achievement will be a billion cubic meters of gas in a day. Accordingly, an inventory is necessary, and an inspection of the equipment used in the extraction of the million tons of oil. More than likely one will find those which need to be written off, as well as those which need timely repair and modernization.

During the work of the 26th CPSU Congress the Tyumen workers took upon themselves the obligation to extract during the 11th 5-Year Plan one million tons of oil and one billion cubic meters of gas in a single day, and achieved the first objective in April 1984. This target, then, was reached six months in advance. It is assumed that a role was played in this by socialist competition, in which all work collectives, and practically all workers of the oil and gas complex, participate through their union organizations. Nevertheless, as sociological research shows, there is a more accurate, or critical if you will evaluate which was issued by the CPSU Central Committee decree concerning the upgrading of organizations, the practices for drawing up accounts of socialist competitions, and encouragement for its victors: greater possibilities for these competitions are still not being fully utilized. A recent sociological questionnaire in one of the largest enterprises of the complex discovered that every fourth person did not consider himself a part of the competition. Nor was the picture any better in the collective of Urengoygazstroy.

In other words, the spirit of competition has not yet permeated the consciousness and hearts of every participant in the development of the power generation riches of this oblast. Certainly, the nature of the work does not explain such a lack of commitment.

Only the full personal commitment of every worker in the complex will make it possible to utilize sensibly the government expenditures, and assure the maximum economic and social impact. And the expenditures have been huge. The five pipelines from the northern portion of Tyumen to the European part of the country that have been built during the current five-year plan cost more than

Volga and Kama automotive vehicle plants, Atommash, and the Baykal-Amur Main Line put together. Only through the highest possible labor and social activity of everyone concerned will it be possible to remain true to the unique path from the first drops of oil to the current million ton production. This is not an easy path. All along there have been heavy losses. The current victory has been won without S. A. Povkh, whose brigade drilled the first operational well at Samotlor, without V. I. Muravlenko, who for many years headed Glavtyumen'neftegaz, and without engineer V. P. Fedorov, who discovered the first Surgut deposits. At least the well operators of the Federovskneft' Administration have made an important contribution to the current level of output. The Povkh and Muravlenko management periods have also contributed their share to these millions of tons. And when the names of the top producers are listed, mention must be made of the chief engineer of the Megion Administration, the son of V. I. Muravlenko, as well as the Nizhnevartovsk engineer, the son of S. A. Povkh.

In this harsh Siberian region, it is especially obvious that we cannot merely [orphan] Ivans who have forgotten their heritage. Positive traditions are just as much of accelerators [of progress] as contemporary technology. But traditions are not accumulated and retained by themselves. Especially here where the average age of the inhabitants is 24-26 years, and where tens of thousands of workers join the collectives annually. Now, when new limits are being explored the question arises, where are we going to find the successors to Fedorov, Povkh and Muravlenko?

The basic flow of new inhabitants to this oil region consists of unorganized migrants. It is difficult to control them. One finds ne'er-do-wells, people on the take, "romantics" who are good for nothing, and unattached seasonal tourists. The flow includes both batchelors and family men with small children, and all of this complicates the already difficult problems of forming and developing an infrastructure in the North.

Understandably a search is on for a way to soften the difficulties of daily life, and to eliminate frivolous expenditures. But not every type of economizing is a sensible one. For instance, specialists of LenNIIPgradstroyitel'stvo are suggesting the utilization of a form of organized selection at future construction projects of this huge oil and gas complex. Under such a system, so they say, individuals would arrive for two-three years, and there would be no need for either schools or preschool facilities. This approach appears to offer savings. But in my opinion they are illusory. If a person is summoned to a northern region for a short time, then in spite of himself he is likely to develop the psychology of a transient. It is difficult to turn such vagabonds into successors to the above mentioned forefathers. Such a person would scarcely care who the fields are named after....

A Siberian does not live by oil alone. People go to the new regions not solely for the "bread of industry," i.e. petroleum fuels and raw materials, but also to develop these areas and live for a long time, perhaps permanently, in these places.

This oil has required the construction not only of fields and plants. Moreover, in the oblast center there have arisen tens of scientific research and

design institutes, universities and four VUZ's. This is not bad for the first two decades on virgin oil lands. But it would be wise not to forget the proverb: If you are planning for a year--sow rye; if you are planning for 20 years, plant a garden; if you are planning for a century--train teachers. The West Siberian oil and gas complex looks farther ahead than one century. This means that its planners should think most of all about teachers.

The leading experts of Tyumen are paying attention to the fact that the percentage of students in the kray per 10,000 inhabitants is lower than republic and national averages. Moreover, it has been declining in recent years. An analogous situation exists with attendance at secondary specialized training institutions. Also, insufficient attention is being paid to the development of tekhnikums. The VUZ's of the oblast, since 1965 have increased their output of graduates by a factor of 6.6, while the tekhnikums have seen a significant decrease. As a result the balance between engineers and technicians at enterprises is far from optimal. Given this sharp deficit in the work force it is not justifiable that the development of secondary professional-technical learning facilities lags behind republic averages.

Siberia is a region oriented towards the future. Therefore, in these days of important victories it is essential to take a look around before moving further. As Yu. V. Andropov noted, it is necessary to have a sober conception of where we are. To rush ahead means to tackle unfeasible objectives; to stand pat means not to accomplish all that we are capable of. A perception of the true dynamics of our society, with all its potential and requirements, is what is needed right now.

The current achievement of a million tons of Tyumen oil daily makes it easier to perceive the social problems of the West Siberian complex. It is not for nothing that sometimes people say that oil is the sun hidden deep in the earth.

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GENERAL

FUEL, LUBRICANT MANAGEMENT IN LATVIAN SSR DISCUSSED

Riga SOVETSKAYA LATVIYA in Russian 28 Mar 84 p 2

[Article by V. Denisov, chief of the State Oil Inspectorate of the Latvian SSR: "A Different Approach--Various Results"]

[Text] At first glance it would seem that there is no need to show the necessity for strictly managing petroleum products. It is, after all, well known how difficult each ton of oil is to extract. However, the results of inspections, carried out by employees of the State Oil Inspectorate attest to the fact that this truism is often forgotten. Judge for yourselves. Last year at the Uzvara and 17 June Riga pastry factories and at the Ventspils and Daugavpils bread combines not a single liter of either gasoline or diesel fuel was saved. At the Proletarskiy rayon bread combine there was even excessive useage of petroleum products. The Ekabpils sugar processing plants just managed to save one and one-half tons of gasoline, but this saving represents only a few percentage points of the generally accepted norm.

Indeed, what kinds of savings can we be talking about when at this same Ekabpils Sugar Processing Plant the travel sheets, in violation of the regulations, are filled out by the drivers themselves, as they see fit. It is not surprising then that in the course of a selective inspection of only 30 travel sheets, additions were found amounting to more than 1,400 ton/kilometers, for which 235 liters of gasoline were requisitioned. Twenty percent of the truck fleet of the sugar processing plant was being operated without properly functioning speedometers, and there was no record book of their readings.

Similar shortcomings were discovered at other enterprises of the sector. Many of them, judging from the documentation, were caused by an absence of the requisite attention to these issues on the part of senior managers and social organizations. No small percentage of the blame for the inefficient use of petroleum products belongs to the employees of the Ministry of the Food Industry. In 1982 this Ministry even failed to distribute to its constituent departments targets for the conservation of gasoline and diesel fuel, and last year this also happened in the third quarter. So should anyone be surprised that for 1983 as a whole the objective for the conservation of fuels was fulfilled only by 15.5 percent.

Minpishchemprom [Ministry of the Food Industry], not concerning itself about savings, is asking for an increase in planned specific norms for gasoline

consumption. Over three years this norm has risen from 136 to 174.2 grams per ton/kilometer. At the same time an analogous norm, according to the Ministry of Automotive Transport and Surfaced Roads of the republic, amounts to 75.22 grams, even though the vehicles of this department operate under much more difficult conditions. Reports of the work of a number of enterprises of Minpishchemprom attest to the increased magnitude of the norm for gasoline consumption. For instance, at the Aldaris Production Association consumption is less than the norm by a factor of 2. What happens is that the Ministry, in creating artificially comfortable conditions for its enterprises, in effect is supporting wasteful practices and squandering.

The situation is no better at the republic Ministry of Procurement. For instance, at the Sarkanays Oktobris bakery products combine an itemized account for the consumption of petroleum products has not been set up. At this same location last year 76 tons of motor fuel was used to heat greenhouses. The Daugapils and Dobel bakery product combines also pay too little attention to conservation. Not a single liter of fuel was saved at either location last year.

In both Minpishchemprom and Minzag organizational-technical measures for improving the management of petroleum products as a rule have only a formal character. According to them it is difficult to determine the impact of one measure or another, or who is responsible for implementing them. The end result is that no one is responsible, and there is no one to ask.

When one speaks to the employees of the ministry about this, they attempt to justify the shortcomings by citing other departments where things are no better. This reasoning does not stand up to criticism, however, since one must compare oneself with positive examples rather than with poor examples. The more so since in this republic there are examples worthy of emulation. For instance, the republic Ministry of Communications deserves nothing but praise. It has established strict controls over petroleum product management at all of its enterprises. On a quarterly basis reports are compiled of transportation work and progress in the fulfillment of measures related to fuel management is analyzed. Gasoline and diesel fuel requirements are determined through calculations and they are utilized only by authorization. This strict management has brought tangible results. For instance, the mobile, mechanized column of this ministry saved 3.5 tons of gasoline and diesel fuel last year.

The situation in the consumption of energy resources by the revhicle fleet of this same ministry is likewise under control. Control measuresments have been taken of all the routes travelled by vehicles delivering mail, and schedules have been set up on this basis that specify the time of leaving the garage, of arrival at the communications enterprise, of loading, unloading, etc. Each route is assigned a number based on the measurement results. The motor vehicle pool dispatcher releases gasoline and records it based on the route number and the control remarks on it for the communications enterprises where the driver has stopped.

Much of this could be adopted at the enterprises of the republic Ministry of Automotive Transport and Surfaced Roads, at the Riga Locomotive Depot and in

other collectives. Indeed, these model experiences should be assimilated as soon as possible. This is, in fact, required by the decree of the CPSU Central Committee and the Soviet of Ministers of the USSR entitled "On Intensifying the Efficiency of Utilization of Automotive Transport Equipment in the National Economy, Intensifying the Struggle With [unauthorized] Add-ons During Shipment of Cargoes by Automotive Transport and Assuring the Security of fuels and Lubricants," in which the management of fuel resources is called a matter of state importance. Solving this problem will go a long way to facilitate the fulfillment of obligations to reduce the costs of production which many collectives took upon themselves last year. We are therefore obligated to exploit more persistently the underutilized capacities to conserve petroleum products. And there are many such reserves at the enterprises of the republic.

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GENERAL

NEW SYNTHETIC GASOLINE PLANT TO BECOME OPERATIONAL

Moscow MOSKOVSKAYA PRAVDA in Russian 3 Mar 84 p 3

[Article: "Synthetic Gasoline"]

[Text] The collective of the Institute of Fossil Fuels is welcoming the day of elections to the USSR Supreme Soviet with a labor success--a unique complex for the production of synthetic gasoline is ready to begin operation on schedule by this important date.

The scale of the facility resembles an entire plant, but its individual divisions are more like small workshops. The raw material will run from unit to unit in pipelines. For the first installation it was necessary to lay 50 kilometers of pipeline and install numerous instruments. The entire production process will be monitored automatically. The arrows of the instruments are steady--they will tell the operators if the process of turning coal into gasoline is proceeding correctly.

This new technique for converting brown coal to synthetic fuel was developed by the specialists at the Institute of Fossil Fuels. It is no accident that these experts chose coal as the raw materials. It was clear that the first industrial enterprises of this type should be constructed in areas where there were coal fields, making it possible to set up the less expensive open pit extraction of the coal. There are surface deposits in our country--the largest is at Kansk-Achinsk. The area covered by the resource base exceeds 40,000 square kilometers. The percentage of total extraction from this source is rising rapidly, and by 1990 its output will exceed that of all other deposits. The reserves at this field are extensive enough so that it will retain this leadership position for many years. Construction of the first installation was begun here. Its construction will incorporate the experiences gained from the operations of what has so far been the only complex in the country, in suburban Moscow.

The production process begins with the conversion of coal into "flour"--a fine powder which is delivered into mixers and then, in paste form, into special furnaces. There is heated to 390 degrees centigrade and mixed with hydrogen rich gas. The next step consists of reactors where the paste is saturated with hydrogen, i.e. hydrogenized. This process looks as follows schematically:



the hydrogen acts to prevent the bonding of gasoline and diesel fuel "particles." It is then necessary to separate the solid and the liquid portions. Combustion of the solid portion makes it possible to "catch" a valuable catalyst. The liquid portion is nothing more or less than synthetic oil. The usual means of purification yields a higher octane gasoline than normally available in our country, and which is therefore ecologically cleaner.

There is another important advantage to this new technology in comparison with existing foreign techniques. The Moscow specialists have introduced qualitative changes in the production process, by reducing the pressure by a factor of 7. This makes it possible to manufacture the equipment with much thinner walls. Reducing the metal content results in significant savings of the expensive high-alloy steel from which the equipment is made.

Experts, engineers and builders are eagerly awaiting the startup of this facility and its first production. It has behind it years of research and development work by the large collective of the Institute of Fossil Fuels under the leadership of professor A. A. Krichko.

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## GENERAL

### STATE COMMITTEE ACTS ON CRITICISMS

Moscow PRAVDA in Russian 6 Mar 84 p 2

[Article: "Gasoline Bubbles"]

[Text] This was the name of a feature article published in PRAVDA on 22 December 1983 ("National Control Page" No 24).

As the first secretary of the Rostov CPSU obkom, I. Bondarenko, informed the editorial offices, the newspaper's report had been discussed at a meeting of the obkom buro and the criticisms contained in it admitted as being valid. P. Bityutskiy had allowed himself to be rude and overbearing in his dealings with subordinates. However, these negative qualities were not included in the qualifications report submitted in relation to his promotion to the position of chief of the city administration of RSFSR Goskomnefteprodukt].

Former first secretary of the CPSU Soviet raykom, V. Denisenko, has been warned for his irresponsible conduct in appointing Bityutskiy to a managerial position without taking into account his moral-political qualities and working habits. N. Ivanitskiy, chairman of the Rostov Oblispolkom, has been sharply censured for the superficial approach that was permitted, and for losing his sense of responsibility and party focus in analyzing the professional and political qualities of the managerial cadres.

Documents of the party obkom buro indicate that conferences were held with secretaries of the gorkoms and raykoms of the CPSU, with chairmen of the ispolkoms of the Soviet of National deputies, and with directors of oblast administrations and departments, at which issues were discussed relating to the struggle with bribe takers and violators of socialist morality standards. The buro also adopted a special resolution directed at upgrading the contents of party dossiers on workers who have been promoted to managerial positions. The Oblast Office of the Public Procurator is continuing to investigate evidence of unlawful add-ons, theft, and misappropriation in the Rostov administration of RSFSR Goskomnefteprodukt.

An answer has also been received from the chairman of RSFSR Goskomnefteprodukt, V. Tarakanov. He also admits that the criticism levelled at his committee was justified. For demonstrated shortcomings the following managers

of RSFSR Goskomefteprodukt administrations have received the following punishments: fuel shipment manager S. Isayev and manager of auto and tractor fuels delivery S. Mel'nikov both have received strong reprimands, as has V. Denisov, manager of the division of labor and compensation.

At a session of the committee board, the question of intensifying the struggle with theft and other violations was discussed.

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## GENERAL

### PREPARATION OF A SOCIAL BASE FOR MOBILE CONSTRUCTION FACILITIES

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 5, May 84 pp 10-11

[Article by A. D. Khaytun, NIPiorgneftegazstroy: "The Social Preparation of Mobile Construction"]

[Text] In a quantitative and especially a qualitative sense, labor resources are a leading factor and limitation of modern production. The builder's professions are becoming more and more pressured, and the mechanization and power supplied per job are exceeding the increase in the number of builders. This process conforms to and corresponds to the trends of scientific and technical progress in a socialist society, but at the same time it substantially changes the form of problems in branch-level management of the greater increase of labor resources and in the social development of branch collectives. The increased complexity of labor activities and the heightened role of the qualified worker (who, to a greater and greater extent, becomes the "subject" of labor, as K. Marx point out) raises the significance of the personal element in the labor process. More and more the spiritual needs of the individual are growing, including those that are satisfied by the sphere of production. This is manifested in the demands of the complexity of the social and economic development of collectives, and in the broadening of the spectrum of questions pertaining to labor conditions.

Thus the social factor requires additional planning and organizational study. It has become obvious that before beginning a fairly large project it is necessary to prepare the social conditions, to conduct the social preparation of the project side by side with the economic planning and engineering preparation. The ultimate goal of such preparation, to supply the installation under construction with qualified personnel having taken into account and satisfied the social needs of the laborers. This essentially coincides with the plan for the social development of the construction-assembly organization, although there are some differences.

The notion of social preparation is applicable to the specific installation, and therefore is discrete and limited in time and scope by the characteristics of the project. The social development of the collective is continuous and is planned for the long term, taking into consideration the expected schedule of construction and assembly jobs. Social preparation, an element of the project of organizing jobs, is directly included in the construction process and closely tied to its technology.

Therefore social preparation can be considered an integral part of the management of both the social development of collectives and at the same time of the actual process of construction. Finally, social preparation is to a significantly greater extent connected with the planning stage of the investment process, since many problems of organizing the social environment and social and economic priorities should be (and can be) solved prior to beginning construction.

The social preparation of construction can fairly conventionally be divided into three stages: pre-planning, planning, and organizational efforts.

In the pre-planning stage, social and economic questions are extensively considered which are stipulated by the geographic and demographic conditions of the construction zone, the methods of organizing jobs (traditional, shift, etc.), the significance to the national economy, and the assigned periods of construction. The end results of this stage may be proposals for supplying the construction with labor resources (sources of reinforcement of personnel, the order of recruitment and training) and, when needed, proposals for establishing social and economic priorities (regional and other wage differentials, social benefits). Social and economic priorities should be reflected in the estimated cost.

The methods of utilizing labor resources and of satisfying the social requirements of the collectives are determined and detailed in the planning stage. Planned here are the development of the social infrastructure, personal housing construction within the area of the project or in the city to which the contracted organization is relocated, and mobile social infrastructure requirements. The order of work is established and the volume of construction of social and domestic service institutions is determined. Social preparation is linked with the design of the construction organization, in the first place with the schedule of labor resource utilization. An agreement is reached among the customer, the general contractors and the subcontractor and also, which is especially important, the organs of territorial administration--the local soviets, which are charged with directing the social development of the territory in the area of the site.

The organizational stage consists in guaranteeing the social factors of construction, including the construction of installations of the social infrastructure, the development and operation of a mobile infrastructure, social-domestic and cultural services for the builders, health care, and ideological work. At this stage the social aspects of personnel selection and training are provided for and the stability of the labor collectives of the given construction project is supported.

The success of the project depends in large part on the completeness and effectiveness of social preparation. This applies in particular to mobile construction and assembly organizations, where a close interdependence and interlacing of social and production factors, and the inclusion of social preparation directly in the production process are necessary.

A significant part of mobility factors relates to social factors. Analysis shows that under traditional forms of organization the periods of construction and relocating contracted subdivisions depends to the greatest extent on the time for establishing the social infrastructure, and more specifically on the construction of capital residential buildings for the workers and their families. In areas of new developments, the "critical path" of the building of the production complex is stipulated precisely by this factor since establishing acceptable domestic conditions requires at least 3 to 4 years. Besides this, building near existing populated points or assigning lodgings in previously built housing are not solutions of the personnel problem, if only because migration and relocation are motivated not only by the interests of the worker, but by those of his family (the availability of schools, work for the wife, conditions for recreation, etc.). Housing alone does not guarantee the necessary quality of labor resources. The scope of social demands broadens in accordance with the growth of worker qualifications. Regular completion of a significant volume of work outside of the permanent dislocation of the enterprise leads to a specialization in mobility as a particular form of organizing construction. The mounting of such a construction project, stipulated by the character of labor and clearly delineated for finite results within compressed time periods, suggests a specialization in the completed complexes of specialized work and in installations finished and readied before being turned over.

A model of a mobile construction organization is advanced which is a complex enterprise that fulfills the functions of social preparation of construction as well as the production functions. A mobile organization should be divided according to the place of its dislocation into a stationary nucleus and mobile subdivisions that have stable connections with the nucleus and that relocate depending on changes in the location of work. The interrelation of the stationary nucleus and the mobile subdivisions also determines the specific character of aspects of construction, and common in the organizational structure is the necessity of securing the relocation of these subdivisions and their connection with the stationary unit, as well as the creation of normal working conditions and vital activity.

The stationary base at its place of dislocation as well as production services includes services guaranteeing mobility (work supply, food services, dispatching, etc.) capital housing resources, a general construction subdivision for establishing and repairing personal housing resources, and management apparatus. It is here that the center for selecting and training personnel is located. The establishment of intermediate stationary support bases in the areas where the work is primarily conducted is a possibility.

In all cases the functions of the stationary base encompass social preparation, but for industrial construction, which entails the transfer of material resources (most characteristic of the construction of linear parts of main pipelines), the basic production functions shift territorially to the work sites. The stationary base of the organization however becomes a distinctive model structure, the functions of which are in a significant measure defined by the social-domestic services, the selection and training of personnel where the workers and their families live and housing construction is in progress. A part of the administrative-management personnel is also located here, mainly unconnected with the operational activity.

In territorial-mobile construction, the procedures to ensure mobility are tied together in many ways with the tasks of the social preparation of the site. To fulfill these procedures special subdivisions are required, and within the trust it is necessary to concentrate command headquarters services that provide transport, supervise the operation of field cities, coordinate social-domestic services for the workers, as well as cultural and ideological services.

Experience shows that the increased complexity in the construction of buildings and the erection of mobile production-storage bases and field cities makes it desirable for the trust (or association) to develop internal specialization in the construction and repair of installations of the mobile infrastructure, both social and production.

The work of ensuring the vital activity of the mobile subdivision workers must be entrusted to specialized sectors (teams) within their ranks. The workers of these sectors implement communal-domestic, medical-sanitary, and cultural services in the field cities, organize trade and food services, transportation of the builders between the field cities and the work site, and establish conditions for participation in sports and recreation.

If the mobile organization is occupied primarily in settled areas, then the functions of medical-sanitary, mass culture, and other services are reduced or are completely transferred to local council of People's Deputies and, on the other hand, under extremely primitive conditions they expand.

It is well known that in construction beyond the limits of population centers, especially in rapid development areas, at the beginning stages of erecting territorial production complexes a certain stereotype of labor activity takes shape, significantly different from that which is typical for construction (industrial) production. It is characterized by an increase in pace of labor elicited by the sum total of production factors, natural and climatic conditions, and also by priorities in pay; a lower level of work rhythm, that is basically determined by the delivery of material resources along widely extended lines of communication, by seasonal work and seasonal delivery of materials; strict limitations in terms of period of construction of installations that are stipulated by the high capital-intensiveness of the work and the economic importance of the installations.

Thus the social preparation of mobile construction should take into account the specifics of utilizing labor resources and encompass the tasks of guaranteeing the rotating duty expeditional method.

A most important element of social preparation of construction remote from the installation's organizational base is the mobile social infrastructure, comprised of the sum total of temporary settlements, services and entities that ensure the conditions of vital activities and the satisfaction of the social requirements of the workers as well as the transportation of shift collectives and individual workers. This infrastructure is a part of the traditional infrastructure of the regions under development and at the same time of the infrastructure of the branches that carry out the mobile construction or pioneer activity. One of the forms of the organization of the mobile

social infrastructure which is peculiar to construction is the field cities, which are established immediately adjacent to the construction sites or on right-of-ways of linear construction projects.

In the process of the development of mobile construction the significance of field cities for the fulfillment of a production program has grown. Now it is essential that the living conditions in a field city be similar to the conditions in a city apartment; high demands are made on the organization of public services of the territory, on architectural planning decisions, and on domestic services.

Field cities should be established as well in settled zones close to population centers; as a rule reserve housing facilities and social infrastructure establishments are absent for a large number of the builders. Setting aside housing for a part of the workers outside the relocation of the base of the organization leads to a decrease in mobility. In our opinion, a mandatory condition for the effectiveness of mobile organizations is the autonomy of their social and domestic services.

The social preparation of mobile construction ensures the rapid deployment of subdivisions near the site, the social demands of those participating in the construction and is most effectively realized in the framework of a special structure, the mobile construction-assembly organization.

A high level of social preparation has been achieved in the building of the Urengoy-Uzhgorod gas pipeline. In the pre-planning stage of the preparation the essential social, economic, and ideological priorities of this project were formulated, which allowed it to be completely staffed by qualified personnel. The material base of the mobile infrastructure was improved and complexes of housing and public buildings for the field cities were either purchased or manufactured at ministry plants. A close interaction was secured (primarily in the social sphere) with the governmental organs of the oblasts crossed by the pipeline.

In planning the organization of construction problems were solved pertaining to the placement of field cities, their topology was defined, model designs were attached, the order of utilization of communications (roads, telephone) was determined, and the tasks of social service agencies were formulated. As a result the mobile social infrastructure was deployed within a short time, the time required for rebasing the subdivisions of the basic project to new sectors of the pipeline was 1 to 2 months.

In the oil and gas construction field considerable positive experience has been accumulated in the social preparation of a site and mobile construction in the development areas. The task of future scientific research is the development of and scientific substantiation of a system of methodological and recommended data in order to disseminate this experience and making it the norm.

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GENERAL

BRIEFS

BAKU REFINERY IMPROVES AIRCRAFT FUELS--Workers at the shop for the study of refinery processes at the Novobakinskiy Oil Refinery and scientists of the Azerbaijan Academy of Sciences' Institute of Petrochemical Processes have successfully tested a new corrosion-inhibiting additive for catalytic reforming for use in place of a costly inhibitor. They also developed optimum variants for performing analyses on Soviet-built chromatographs, which holds out the promise of great benefit to the enterprise. Altogether, since the beginning of the 5-year plan the shop's innovators have come up with about 50 technical problem solutions, which have been of great help to the refinery workers. For example, one of the bottlenecks in units for the initial refining of petroleum was an inefficient wrapping scheme of the heat exchangers. On recommendation of the shop personnel, the vacuum system was altered and the petroleum-heating system was modernized. Shop specialists also selected an optimum raw material for the production of industrial carbon, resulting in a profit of R33 per ton of product. The formula for making aviation gasolines and aviation kerosene was changed. As a result, the sulfur content in the kerosene decreased, and the production cost of the gasolines was reduced by tens of thousands of rubles. Engineers O. Rakhamimova, Kh. Kuliyeva, V. Sokova and others made significant contributions to this work. [By Z. Aliyev] [Text] [Baku VYSHKA in Russian 5 Jul 84 p 2]

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